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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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1949

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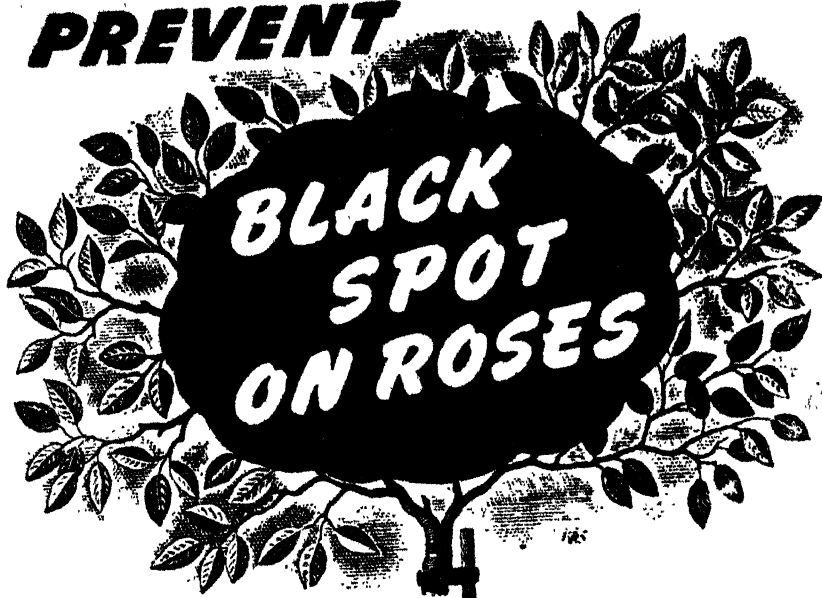
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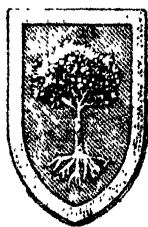
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THE LILY YEAR BOOK 1949

This contains interesting articles on Lilies at Delmonden Manor by Dr. Amsler, Lilies at Wisley by Mr. F. Hanger; the propagation of Lilies is described by Miss E. K. Field, while Mr. W. A. Constable deals with Lilies for the beginner. The book is dedicated to Mr. R. W. Wallace, V.M.H. Authoritative accounts of *Lilium Davidi* and *Lilium Davidi* var. *Willmottiae* by Mr. A. D. Cotton from the Supplement to Elwes Monograph continue our reprints from that work. Mr H. F. Comber contributes an important article on a new classification of Lilies. A special section on Lilies in New Zealand, where unusual success seems to have been obtained, is also included. The book also contains a number of important Lily Notes, accounts of the Awards to Lilies and of Lily exhibitions during the year and recent Lily literature. The book is illustrated both in colour and in monochrome.

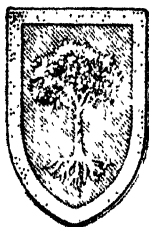
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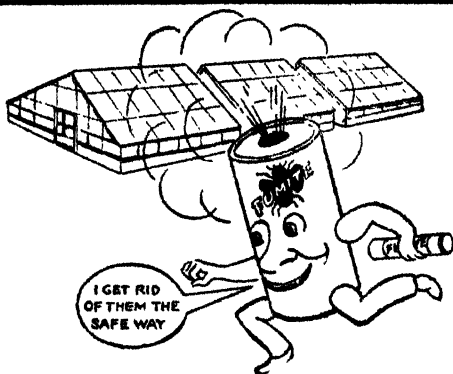
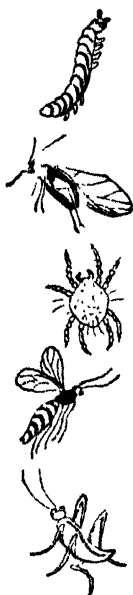


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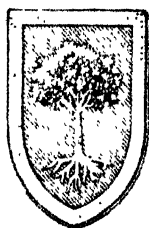
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VINCENT SQUARE, LONDON, S.W.1.

CAMELLIAS AND MAGNOLIAS

Report of the Conference held April 4 & 5, 1950

This contains the important papers read to the Camellia and Magnolia Conference held on April 4 and 5, 1950, under the Presidency of Lord Aberconway, C.B.E., LL.D., V.M.H. These were prepared by Mr. George H. Johnstone, O.B.E., Mr. T. T. Yü, Dr. H. Harold Hume, Mr. J. E. Dandy, Mr. H. G. Hillier and Mr. J. R. Sealy and are printed together with the discussions which followed their papers. These deal with many aspects of the cultivation, propagation and nomenclature of these two genera. There are also included accounts of the Camellia and Magnolia Tour and the special show held in conjunction with the Conference. This report contains the first account and coloured plates to be published in this country of a number of varieties of *Camellia reiculata* grown in Yunnan.

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FRUIT YEAR BOOK, 1950

This volume is dedicated to Mr. M. B. Crane, F.R.S., V.M.H., and contains an appreciation of him by Sir Ronald Hatton, F.R.S., V.M.H. There is a special section on fruit growing in Ireland, while the unusual method of training Apple and Pear trees as spindle bushes is fully described and illustrated with line drawings. There is a valuable article on factors affecting fruit production in Plums by Mr. Gavin Brown of the John Innes Horticultural Institution; the U.S.A. method of pruning Peach trees is also fully described. Overseas fruit growing includes a long article on fruit growing in Sweden by Dr. Emil Johansson. Diseases are dealt with in articles by Dr. Massee on the fruit tree Red Spider Mite and its control, by Dr. Luckwill on virus diseases, and by Mr. Hubert Martin on the new phosphorus insecticides. The reports of the Fruit Group Discussions on the selection of fruits for exhibition and the technique of showing and on late-keeping varieties of Pears are included. It is hoped that this volume will be as useful to fruit growers as its three predecessors.

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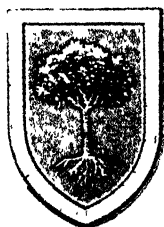
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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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Part I

January 1950

THE SECRETARY'S PAGE

ANNOUNCEMENTS—JANUARY AND FEBRUARY

Shows, Lectures and Meetings

TUESDAY, JANUARY 31. 12 NOON TO 6 P.M.

3 P.M. LECTURE: *An Expedition to Nepal* by Mr. Oleg Polunin.

WEDNESDAY, FEBRUARY 1. 10 A.M. TO 5 P.M.

TUESDAY, FEBRUARY 14. 12 NOON TO 6 P.M.

3 P.M. *Annual General Meeting*, Lecture Room, New Hall.

WEDNESDAY, FEBRUARY 15. 10 A.M. TO 5 P.M.

The Orchid Committee and the **Fruit and Vegetable Committee** will meet on January 10 to consider new plants submitted to them for recommendation for certificates.

Annual General Meeting—The Annual General Meeting to receive the Report of the Council for 1949 and a statement of accounts for that year will be held at 3 P.M. on Tuesday, February 14, in the Lecture Room of the New Hall.

Subscriptions—Fellows are requested to note that the first Show of the year is being held a fortnight earlier than has been the practice latterly— a fortnight before the Annual General Meeting. Fellows are, therefore, requested to forward their annual subscriptions at an early date so as to receive tickets in time for admission to this Show and also to assist the office staff to deal with the extra work which falls upon them at this part of the year. A convenient form for use when posting a subscription was enclosed in the December JOURNAL.

Examinations—Candidates who wish to enter for the Society's Examinations in Horticulture in 1950 are reminded that the closing dates for entry forms are as follows:—

GENERAL EXAMINATION IN HORTICULTURE AND GENERAL EXAMINATION IN HORTICULTURE FOR JUNIORS—Monday, January 16, 1950.

EXAMINATION FOR THE NATIONAL DIPLOMA IN HORTICULTURE (Preliminary and Final) and **N.D.H. (Honours)**—Wednesday, February 1, 1950.

EXAMINATION FOR TEACHERS OF SCHOOL GARDENING (Preliminary and Final)—Friday, April 28, 1950.

How to get to Wisley—Fellows and Associates who wish to visit Wisley and who are travelling from London are reminded that the simplest way is by Green Line Coach No. 715 which leaves Upper Regent Street, opposite the Polytechnic, at 7, 27 and 47 minutes past the hour *en route* for Guildford. An alternative route which may be easier for some Fellows is by train from Waterloo to Kingston and thence by the Ripley bus, No. 215, which leaves the bus station, about one minute's walk from Kingston railway station. Fellows coming from the south are advised to go to Guildford and take the 715 Green Line bus from there. All these buses will stop, on request, at the turning on the Portsmouth Road which leads to the Gardens.

Small Exhibits from Fellows—It frequently happens that a Fellow who is not in a position to stage a collection of plants, flowers, fruit or vegetables has one or two interesting or particularly well-grown specimens which he would like other Fellows to see. A small exhibit of that sort is always welcome at a Fortnightly Meeting and, provided that the exhibit does not consist of more than three pots, vases or dishes, it may be staged although the exhibitor has not applied for space beforehand. The exhibit should be handed to the clerk at the Small Exhibits Table by noon on the first day of the Meeting and the clerk will provide a card to go with the exhibit. Exhibitors are not permitted to place on this special table any notices or price-lists, nor may any orders be booked there.

The Botanical Magazine—Four parts of Volume 166 were issued during 1949 and copies are still available. The plates were printed in colour gravure. The subscription rate is £4 per annum or one guinea per part. This volume is dedicated to our President, LORD ABERCONWAY, C.B.E., LL.D., V.M.H., and contains a reprint of the portrait of him by SIR OSWALD BIRLEY which hangs in the Council Room of the Society. A number of interesting plates have been arranged for the 1950 volume. It is hoped that as many Fellows as possible will become subscribers.

Journal and Botanical Magazine Binding—It has now been arranged for Fellows' copies of the JOURNAL to be bound in green cloth with gold lettering and crest and for volumes of the *Botanical Magazine* to be bound in dark blue buckram with gold lettering. Each volume of the JOURNAL will cost 8s. 6d. plus 1s. for return postage and packing and each volume of the *Botanical Magazine* will cost 13s. 6d. plus 1s. for return postage and packing. Parts for binding should be sent, with remittance, to Mansell (Bookbinders) Ltd., 31-34 Cursitor Street, Chancery Lane, E.C.4. The parts should *not* be sent to the Offices of the Society. Enquiries for binding in special styles should also be addressed direct to Messrs. Mansell.

WISLEY WAR MEMORIAL

TWICE in a generation our Country has been called upon to defend its very existence in a World War. Although the casualties in 1939-45 were fortunately not so severe as in 1914-18, the peril in which this country stood was greater.

Many members of the Society's staff and students from Wisley served in His Majesty's Armed Forces during this last war and fifteen men from Wisley laid down their lives in some part of our far-flung battle line.

In grateful remembrance of those who made the supreme sacrifice, and to commemorate the services of the others who happily returned, the Council has caused a memorial to be placed in the Entrance Hall of the Laboratory at Wisley. This memorial is on the wall facing and balancing the 1914-18 war memorial and is of similar design, being composed of Hoptonwood stone enclosing a bronze panel on which are inscribed in bold relief the names of those who lost their lives. (Fig. 3.)

The memorial was unveiled on Monday, October 17, 1949, by the President, LORD ABERCONWAY, whose eloquent words will long be cherished by those who were privileged to hear them.

The ceremony was preceded by an invocation spoken by the Director of the Gardens and a short service conducted by the REV. C. E. WORMELL (Rector of Wisley) and the REV. M. E. THOMAS (Vicar of Ripley) in the presence of Members of the Council, of the Wisley Advisory Committee, relatives of the fallen and the Staff and Students at the Gardens.

WISLEY IN JANUARY

IN this, the first month of a new year, some mention of the historical background of the Gardens may be of interest to new Fellows. Its history as a garden dates from the 1870s, when the late MR. G. F. WILSON, a former Treasurer of the Society, purchased the sixty-acre "Oakwood Estate," at Wisley, formerly a glebe farm. An imaginative gardener, he constructed the chain of ponds at the foot of what is now the Rock Garden, and converted a natural Oak wood into a charming wild garden, the basic design of which remains unchanged to this day. After his death, the estate was purchased by the late SIR THOMAS HANBURY who, in 1903, gave it in trust for the perpetual use of the Royal Horticultural Society. At that time the area under cultivation was little more than six acres, but it has been extended until the total area at the present time owned by the Society is about 300 acres; 100 acres being laid out with ornamental plants and 70 with fruit and vegetables. The laboratory was built between 1914 and 1916, incorporating the original smaller building, and the beautiful wrought-iron entrance gates were erected in 1926 as a memorial to the late REV. WILKS, Secretary of the Society from 1888 to 1920. The first Superintendent is also commemorated by the sundial a few yards further on, the most recent memorial being the clock, erected by the Gardens Club above the entrance to the laboratory, in honour of the staff and students who fell in the last war.

The greenhouses will probably attract most of the scanty number of visitors this month. In the Half-Hardy House they will be rewarded by the deep blue *Lithospermum rosmarinifolium* and the hanging red and yellow flowers of the Abutilons trained against the northern end. The Silver Tree from Table Mountain, *Leucadendron argenteum*, is also striking. It can only be grown in the open in the extreme south-west of Cornwall where it will sometimes flower, bearing rather insignificant silver-yellow cones of flowers at the tips of the branches. It should be watered with great care, especially when young, and should be given no manure. Growing behind this tree is a plant of *Crassula arborescens*, the stout branches giving it a rather similar appearance to its neighbour, but the grey, ovate leaves are succulent and margined with red.

In the next house there is a trial of *Primula sinensis* and *P. s. stellata* varieties which should be in full flower. The former are dwarf and compact in habit while the latter are more graceful. The collection is a comprehensive one, comprising twenty-six varieties, both single and double, the colours ranging from pink through shades of salmon to deep crimson.

There are many flowers to be seen in the Temperate House. Outstanding among them are the Acacias, such as the so-called 'Mimosa' (*A. dealbata*) seen in every florist's shop, although the blue-leaved *A. Baileyana*, the Cootamundra Wattle of New South Wales, is more lovely. *A. Drummondii* is a smaller shrub with flowers closely arranged in yellow spikes rising from the leaf axils instead of in drooping racemes made up of many fluffy balls. Also in the centre bed is a good specimen of the Bird of Paradise flower, *Strelitzia Reginae*, named in honour of the consort of GEORGE III, who came from Mecklenburg-Strelitz and was a keen botanist. The extraordinary flowers rise above the Banana-like foliage, and bear close resemblance to a crane, the horizontal spathes representing the bill while the orange and purple flowers form the bird's crest.

Rhododendron mucronatum has been flowering intermittently for many months, bearing characteristic large white flowers which are glandular on the outside; near it is a beautiful bush of *Camellia japonica* 'White Swan,' with large single flowers of perfect form. The side staging is kept colourful with potted Cinerarias, Primulas, Cyclamen and other winter-flowering plants.

The Stove House has now been completely restocked and contains a variety of foliage and other plants, one of the most noteworthy at the present time being *Agapetes macrantha*, with red-veined, waxy bells. The nucleus of a collection of Orchids has kindly been presented to the Society by the Orchid Growers' Association, and some of the Cattleyas, Cypripediums and Calanthes will already be flowering.

In the Award of Garden Merit Collection is a specimen of *Ilex Aquifolium* var. *camelliaefolia* which frequently bears a good crop of berries. It is distinguished from other varieties by the absence of spines on its large, dark leaves.

Going towards the Wild Garden the visitor passes the first of the 'Lenten Roses' in flower, near the lower end of the Bamboo Walk. A few other species of this varied genus can be recognized here, such as the

commonly grown Christmas Rose, *Helleborus niger*, with large white drooping flowers suffused with rose, and *H. corsicus* with panicles of drooping apple-green flowers.

Turning into the Wild Garden on the way to Seven Acres a plant of *Garrya elliptica* hung with long silver catkins will be seen. Plants which bear staminate catkins should always be planted as their flowers are much more decorative than the pistillate ones.

In Seven Acres itself some of the earlier varieties of *Erica carnea*, such as 'King George' and 'Queen Mary' will be flowering, as will *E. × darleyensis*, a hybrid between *E. carnea* and *E. mediterranea*. Many of the Witch Hazels are opening their spidery yellow flowers, the largest flowered being *Hamamelis mollis*.

The Rock Garden, being built on a north-facing slope, is slow to come to life, but even so a number of Snowdrops and perhaps a few flowers on *Iris histrioides* may be found.

Near the Alpine House a number of Crocuses are springing up, notably *C. Tomasinianus* and *C. susianus*. Inside the house the number of plants in flower depends entirely on the amount of sunshine there is during the month, the only plant which seems oblivious of the cold being *Iberis semperflorens*. During favourable spells a number of deceptively delicate-looking Cyclamen species will be in flower. *C. coum* carries its fat flowers of pale magenta above leaden green leaves. *C. graecum* needs some protection, when it will produce attractive rosy-red flowers with darker carmine streaks at the mouth. Perhaps the most graceful of all is *C. persicum*, being far removed from the flamboyant varieties derived from it by the florists. It grows somewhat taller than the other species and the twisted petals give the flower a rather frightened appearance. It can be distinguished from all others in that the flower-stems do not twist like a corkscrew as the seeds mature.

The entrance can be reached by way of the Species Border where two winter-flowering Honeysuckles are growing, both having insignificant white flowers but which are sweetly scented. The large bush is *Lonicera fragrantissima* while the smaller, *L. × Purpusii*, is a hybrid between this species and *L. Standishii*, all three being very similar.

Under the laboratory walls are two shrubs flowering in mild spells; the yellow form of the Wintersweet, *Chimonanthus praecox* var. *luteus*, and the white-flowered *Viburnum foetens*, a species from the western Himalaya akin to *V. grandiflorum* but different in habit and foliage and usually flowering several weeks earlier at Wisley.

SHRUB ROSES

G. S. Thomas

(Lecture given on June 28, 1949; MR. BERTRAM PARK in the Chair)

WE shall probably all be agreed that flowering shrubs are the salvation of modern gardens. They provide the only means of gardening large areas with the minimum of labour to which most of us are limited nowadays. In my own mind I felt convinced I knew what a shrub was; but when thinking about this afternoon's talk I began to wonder what the difference was between a shrub and a bush. Reference to the dictionary proved them to be the same, but I think that we all speak of our modern bedding Roses as "bushes" and the larger growing types—the species and the old hybridized groups—as "shrubs," and I will conclude that this is understood amongst ourselves to-day.

There can be no doubt that many Roses do qualify for inclusion with the best of our flowering shrubs. They provide flower in their different groups from May until the frosts end their activities in October or November; many follow their flowering with brilliant fruits in late summer and autumn, and not a few give an autumn display of gorgeous foliage. The young foliage, again, of several is richly tinted in spring and early summer. Many can be grown in any ordinary garden soil, although the more generous the feeding the richer will be the reward of colour; they require little pruning, and are in short happy thrifty plants for many uses in the garden.

We can divide our shrub Roses into three groups; the species and their very near varieties or garden forms; the new hybrid shrubs and the select groups of "old fashioned" Roses.

Now, Roses have been favourites with lovers of flowers for hundreds, even thousands of years, and as is usual with his favourites, man has tried to improve upon Nature's perfections. He has, since he became a flower fancier, taken nearest to his heart several different groups of Roses from time to time, with the result that recent Rose history has been a series of fashions, or trials and errors. One or more species have been "selected" and then left for some other species or group. To-day we are, I think, in a state of flux; the production of new Roses is proceeding along several lines, but I believe the ultimate trend may be towards perpetual flowering shrub Roses, such as might be evolved from a union of the merits of the hybrid Polyanthas and the Hybrid Musks. But it is dangerous to prophesy, and, perhaps, after all this is but wishful thinking on my part!

I do not wish to give you a lot of botany and history and I want to avoid handing out too long a list of names, so I propose to take the main groups of shrub Roses one by one, calling attention to a few good things in each, and spending most of the space at our disposal in looking at them from the garden point of view.

Taking the species and their near relatives first, I would again divide them into three. First the greater shrubs up to 10 or 12 feet like *Rosa Moyesii*; then the more well furnished shrubs of lesser size, and here our example may be *R. Hugonis*; and lastly the low growing Burnet or Scots Roses, and the sprawlers.

There is a big group of Roses covered by *Moyesii*: there is *Moyesii* itself, and its fine hybrids *highdownensis* and *Hillieri* and other lovely species like *R. Sweginzowii*, *setipoda*, *Davidii*, etc. I have regarded the great gaunt branches of *Moyesii* and *Hillieri* as too large for the average garden of to-day, but, seeing *Hillieri* in MR. A. T. JOHNSON'S garden recently, I realized that they are admirably suited to small gardens. Their leaves and twigs are right above us, and plants and smaller shrubs enjoy the delicate shade from their filigree leaves. And to see their handsome blooms against the sky is a glorious sight every June. On the other hand *R. Moyesii* has a garden form 'Geranium' which is more compact in habit and of brilliant tint in flower and fruit. *Highdownensis* is a magnificent picture also in its two seasons of flower and fruit, and is suitable for the largest plantings.

Coming next to the medium to large shrubs, usually bushy and well filled up to 6 or 7 feet; we have the popular *R. Hugonis* to consider. Lovely as this may be, I would in preference choose its hybrid *cantabrigiensis* as in my experience it is less apt to die back than *Hugonis*; although with both *Hugonis* and another species, *xanthina spontanea*, this "die back" is not usually noticed with plants on their own roots. *Cantabrigiensis* is equally beautiful to *Hugonis* and a more compact shrub, with even more lovely flowers. *Hugonis* has produced another lovely hybrid with the exquisite creamy *altaica* (a variant of *R. spinosissima*), which has so far not been named; it was raised by DR. C. C. HURST at Cambridge and I think it has a great future with those of us who like these early flowering yellow Roses. Its 4-inch wide blooms are of a soft creamy yellow. There has been much confusion about that most magnificent of yellow species, *R. xanthina*; this is partly due to the fact that it was first introduced from China in its double form, which should be called just *R. xanthina*. The single type is known as *xanthina spontanea*, and has also been called 'Canary Bird.' As far as I know it can be distinguished from all the other yellow Roses by the down on the upper surface of the newly unfolded leaves and its large rich yellow blooms. As grown at Edinburgh Botanic garden, isolated on the grass slopes, it can be a very fine shrub.

Leaving the yellow flowered group of our medium sized species we must put in a word for a native, the Sweet Brier or Eglantine (*R. Eglanteria* or *rubiginosa*), whose abundance of delicious single pink flowers are as lovely as any, and send their scent afar; I do not think the Penzance Sweet Brier hybrids are more beautiful than their parent species. Those who need to be convinced should visit MR. W. B. HOPKINS' garden at Hapton, Norwich, at Sweet Brier time. Our native Dog Rose (*R. canina*), has given us a first-class plant in its richly coloured variety *Andersonii*. The same may be said of Wolley Dod's Rose, the double form of *R. pomifera*, whose clear pink flowers make such a lovely combination with the grey-green leaves. The Japanese Rugosas form such an important group that I am going to leave them for consideration on their own presently, but from China we have *R. Wardii*—the so-called 'white *Moyesii*'—a gracious light shrub whose cupped nodding white flowers are distinguished by their mahogany antlers, and *R. Farreri persetosae*. This, the 'Threepenny-bit' Rose, was specially good

in the garden of SIR FREDERICK and LADY MOORE near Dublin, a fortnight ago; there it was growing in half shade, and I think LADY MOORE was right in saying it needs this help. I have never seen a better specimen of it, 7-8 feet across, and smothered in tiny pink flowers, and if it benefits from half shade in Dublin, I think it should certainly be given the same over here.

For creating an almost all-white effect nothing could be better than *R. Soulieana*. In MRS. MUIR's garden at Kiftsgate Court, Hidcote, where Roses take a very high place of honour, I saw this in bloom, and I must say it was just covered with its single white flowers with golden centres. The foliage is a light grey-green and completes the picture. None of the Roses so far mentioned need much in the way of pruning, except for the occasional removal of old spent branches.

First amongst the dwarf and thicket forming species are the Scots Roses, or Burnets, forms of *R. spinosissima*. I believe there were over a hundred varieties in cultivation, all mere selected forms of this variable species, in the early years of the last century. Certainly they are very sweet and charming; their compact thorny thickets, up to a yard or so high, are dotted all over in May and early June with single or double flowers in yellow, white, pink or maroon. They are admirable for dwarf hedges and thrive in sandy poor soils; in fact I came upon large areas of the type on the sand dunes near Newcastle, Co. Down. Another species, excellent for colonising, is *R. virginiana* (*R. lucida*); its pink flowers are good, likewise its scarlet hips, but its autumn foliage, red and beetroot and orange, is unequalled with me amongst the Roses. It has a pure albino and a charming double, the 'Rose d'Amour.'

There are certain sprawling Roses that are most admirable for covering banks, for hanging over retaining walls, for the larger rock gardens, and of course for the front of shrub borders. The smallest is *R. Richardii* (*R. sancta*), a really charming plant when its wide wild Roses cover the leafy hummocks, and its young shoots and foliage have an air of distinction through the summer. The *macrantha* hybrid 'Raubritter' with unique and long lasting cupped double pink blooms is much the same size. *R. macrantha* itself and its *rugosa* hybrid, 'Lady Curzon' make a much larger mound, in fact they are both almost 6-8 feet wide shrubs; both have, too, an exquisite purity of bloom, in their wide single blush pinks.

Rather larger again are the two *rugosa* \times *arvensis* kinds, *R. Paulii* (*R. rugosa repens alba*) and var. *rosea* (Fig. 8). They have a folded charm of petal not seen in other flowers, and the white base around the yellow stamens in *rosea* lightens up the clear pink of the blades of the petals to an extraordinary degree. Just over the wooden bridge at Wisley, in the Pinetum, is a group of 4 or 5 plants of *Paulii*, an impenetrable mass of interlacing branches, some 15 feet across and 3 feet high when I last saw it, starred all over with white, like a Clematis, in June. These sprawling Roses cover up their old twiggy wood with their new branches, making an ever larger mound; pruning is thus difficult, but seldom required.

The Austrian Briars, varieties of *R. foetida* (*R. lutea*) do not fall into any of the above categories. They are rather untidy growers, demanding

much sun, a warm soil, and very little pruning. *R. foetida* itself is sulphur yellow, and the 'Austrian Copper' (*R. f. bicolor*) are two brilliant kinds, the latter having imparted its brilliance to the Pernetianas, later fused with the H.T.'s. 'Persian Yellow' was at one time a most important plant; it was the only double yellow Rose of any size suitable for general cultivation until its hybrids and those of the Tea Rose came upon the scene in the nineteenth century. Its vivid yellow, fully double flowers can make a brilliant effect on a well grown shrub of some 6 feet high and wide. 'Rustica' is a later hybrid and I can recommend this for those who like a rich parsley-green shrub with wide, semi-double yellow blooms; it inherits the strange rich fragrance of the group.

The Rugosas, some old and some new, are very important flowering shrubs. They give us scented flowers from early June till late October, and many have very fine round hips and bright yellow autumn-leaf colour. I would not go so far as to say what colour a typical *rugosa* is, as I only know the washed-out rather thin-growing type which is grown as an understock, and the various named kinds; the understock is by no means characteristic of the group as I know them. The particular garden value of these Roses is found in their lovely rounded, bushy habit, well clothed to the ground if they are given space to grow sideways. They need at least 7 feet square of space and will reach as high in time. Their vigour and health are matched by their most accommodating qualities; they do not seem to mind what soil they are given, from a dry chalky one to quite wet acid soils. But of course the best bushes are found on an ordinary well dug decent loam. We can divide them into two horticultural groups: the typical rugosas, and the more hybridized kinds. Taking the single flowered types first, we have *alba* (white), *rubra* (or *atropurpurea*) rich crimson purple, and the lovely 'Frau Dagmar Hartopp,' in clear light pink. The later blooms of these of course are all accompanied by large hips, bright red in the first two, dark red in 'Frau Dagmar.' There is also the astonishing *scabrosa*, whose truly huge mallow-purple blooms are followed by tomato-like hips. With them can be used a set of doubles in almost the same colours; 'Blanc double de Coubert' (white), 'Roseaie de l'Hay' (crimson purple), 'Belle Poitevine' (mauve-carmine) and 'Delicata' (pale lilac). All these kinds have lovely glossy neat foliage in rich green, totally different from the worrying stock that sprouts amongst other Roses. Pruning is almost nil, as for the first groups of species.

The more hybridized rugosas contain some equally beautiful kinds. There are two excellent reds, 'Mrs. Anthony Waterer' and 'Parfum de l'Hay'; the former is a very dark crimson fading to a purple crimson, while the second is lighter. 'Parfum de l'Hay' has never pleased me until this hot summer, it evidently needs a continental heat to enable its flowers to open properly. These make shrubs up to 5 or 6 feet and nearly as wide. Such kinds as 'Conrad F. Meyer,' a magnificent silvery Rose with a good large flower of H.P. persuasion, and its exquisite blush-white sport 'Nova Zembla,' are admirable with 'Sarah Van Fleet' at the back of the border where their gaunt prickly stems can be concealed, supporting a fine bushy top with lots of flowers. These five kinds

do need spring pruning to encourage good blooms, cutting back the side shoots, and occasionally removing old stems as well.

The hybrid 'Agnes' (*R. rugosa* × 'Persian Yellow') brings soft yellow to the rugosas, and like all these types is almost perpetual flowering. No less remarkable is the hybrid *rugosa* × *bracteata* (Mermaid's parent), known as 'Schneezwerg.' Here we have a delightful little bushy plant up to some 4 feet with neat leaves and an abundance of semi-double white blooms with golden centres, just like Japanese Anemones, the later blooms coinciding with small orange hips.

We are now leaving our second group of Rose species and are in fact already in the group which I suggested we might term the new hybrids. *Rugosa* has certainly played its part well—it always does—and now we have one of the most important hybrids to consider, 'Nevada,' which is reputed to be *R. Moyesii* × 'La Giralda.' This magnificent shrub, some 7 feet high and wide, will produce several hundreds of blooms during the season. Its great 4–5-inch wide nearly single blooms starred along the arching branches are a wonderful sight. In cool weather they are creamy-white, but during this hot weather they have curiously developed a decided warm pink blush. It fortunately has very few thorns and does not appear to need much pruning. I think this is nothing short of an epoch-making Rose; even more than this, it is the first really fine, well furnished *perpetual flowering shrub* that has been produced, and it or its progeny have probably a great future. Apart from an occasional removal of big clusters of twiggy branches, it requires no pruning. (Fig. 6.)

Some very important Roses reached me from the Continent recently, the trio 'Fruhlingsgold,' 'Fruhlingsmorgen' and 'Fruhlingszauber.' They are *spinosissima* hybrids and bid fair to make good bushes. The first has lovely foliage and great saucer-shaped blooms, semi-double, in May, of most lovely canary-yellow, and deliciously scented. The second I cannot say much about, but the third is about the most lovely in shape and tint of all the single Roses I know. The deep blush petals have soft creamy bases, which are offset by the dark mahogany stamens. The blooms are some 4 inches across and appear more or less continually through the summer, after the first glorious June display. 'Fruhlingsgold,' 'Fruhlingszauber' and perhaps 'Fruhlingsmorgen,' will be in many gardens in the future. *Spinosissima* has given us two other hybrids which I must mention. One is 'Karl Foerster,' whose almost scentless fine double white flowers are inherited from 'Frau Karl Druschki'; this is a good rounded bush with light-green leaves up to some 5 feet. And then there is the valuable old 'Stanwell Perpetual,' a lax sprawling bush whose flat, flesh-pink, double blooms appear incessantly, exhaling a delicious fragrance. A great treasure, especially for light soils. These need no more pruning than 'Nevada.'

I am not going to suggest that none of the above hybrid Roses trace their long flowering season to *R. chinensis*, for it is obvious that the China Rose characters are in some of them. But I think the rest of the hybrids may be said to lean more towards this species, with its soft leaves and smooth stems and translucent thorns. The Hybrid Musks are most worthy shrubs, being crosses between Musk Roses and various modern hybrids. They give us in the main a bushy habit, glossy dark

foliage, and clusters of small to medium sized, sweetly scented flowers from white, pale yellow, and blush pink to dark crimson. Generally we have a great display of blossoms in June and July, followed by occasional blooms during August, and ending with the great basal shoots throwing up their trusses of bloom in the early Autumn. Pruning consists of cutting off twiggy wood as soon as it has flowered; removing some of the big old branches every spring, and at the same time shortening by one third or so the big new shoots from the base. A few of the best varieties are 'Prosperity,' white; 'Danae' and 'Thisbe' in creamy yellow; 'Felicia,' 'Cornelia' and 'Penelope' in salmon and blush pink; 'Vanity,' a great and wonderful bush in vivid carmine-pink, always in flower; 'Nur Mahal' deep carmine, and 'Wilhelm,' dark crimson. The last is of Kordes' raising in Germany, one of a race parallel to our own Hybrid Musks; it is not so sweetly scented as some, but in all other ways fits well here. I rank 'Vanity' and 'Wilhelm' as two exceptionally fine perpetual flowering shrubs.

I should like to mention now a few Roses which link these modern hybrids to the old groups, such as the lovely egg-yellow, deliciously fragrant 'Alister Stella Gray,' an old Noisette and a fine shrub up to 9 feet or so, and you can always pick a perfect buttonhole bud from it. It is, in effect, a shrub like a huge Hybrid Musk producing the same enormous shoots in the autumn, bearing trusses of blossom, like 'Vanity,' over a foot across. 'Alister Gray' will also climb up to 20 feet or so on a wall. Even more exquisite in the dainty perfection of their buds is 'Cecile Brunner.' This early type of Polyantha has a stalwart, free-growing variant which we are now calling 'Cecile Brunner Major,' and a true climbing sport. The major form throws up great feathery pyramids of tiny blossoms 6 feet high, and is a most decorative plant. The China Rose itself has a form called *mutabilis* which in our more exposed part of the country needs a sheltered corner; in Ireland and in the Cotswolds I have seen bushes up to 6 feet high, loaded with their single blooms. The buds are orange-red, opening to salmon-buff, and fading to a deep coppery rose. Its other names are 'Tipo Ideale' or *turkestanica*.

Lastly amongst these perpetual Roses we have the Bourbons. They were the result of crosses between the China Rose and the Damasks and other old Roses, and were the beginning of the race known as Hybrid Perpetuals. 'Mme Pierre Oger,' with its shell-like flesh-white petals deepening in such hot weather as this to a lively rose-red, is a gem of the first water. It is a fairly fixed sport of 'Reine Victoria,' but recently both my plants and those at Wisley have reverted, on an occasional branch, to the original variety. Two others of the original type of the Bourbons are 'Commandant Beaurepaire,' a Rose of luxuriant leafage with flowers richly striped in crimson and purple, and its pale sport 'Honorine de Brabant,' in pale pink and crimson-purple (Fig. 7). Both of these make extra fine bushy shrubs.

We are left with the old-fashioned Roses. There has been some discussion and questioning about this title. Of course the Bourbon group, and, indeed, any race of Roses not in popular esteem to-day, has a right to be called "old fashioned," but in my own mind—and, I feel,

to the majority of Rose lovers—the title does really belong to the Roses which were popular in the last two centuries, but which ceded their popularity gradually to the perpetual-flowering China and Tea hybrids. Apart from the Scots Roses four main groups are concerned, the Alba or white Roses, fine shrubs from 3 to 6 feet and pre-eminent in their lovely greyish foliage and exquisitely scented and tinted blooms from white to rich pink; the gallicas or French Roses ('Roses of Provins'), which are neat, mostly compact, bushes from 3 to 5 feet, with vivid upturned flowers of any colour from blush to dark purple; the Damasks, rather larger again, and very variable in their characters in pink and white; and the centifolias or 'Cabbage' Roses ('Provence' Roses) with their later variants the 'Moss' Roses. The centifolias have a lax growth, large leaves and globular mostly pink blooms, while the mosses vary from the same type to kinds probably bred with the gallicas and inheriting their richness of colour and neater habit. All four groups are noted for their rich perfume, and the quantity of flowers which are borne literally in hundreds on each bush, in one glorious flush at mid-summer. They are mostly fully double, thickly imbricated, and create a rare picture of beauty. Their uses are for the mixed border, and the shrub border, or anywhere else you like. To my mind they look best when grouped with herbaceous plants and soft grey foliage. I think they have as high a horticultural value as any Rose and they have a very homely and sweet beauty.

SUMMER AND AUTUMN FLOWERING SHRUBS

F. P. Knight

(Lecture given on October 18, 1949, MR. J. L. RUSSELL in the Chair)

WHEN I first gave serious consideration to the way I should present this subject I had to decide which shrubs qualify for inclusion. For many years I have considered summer has arrived when *Sophora viciifolia* is in flower, and I well remember in June, 1944, looking at a specimen of this with an American Air Force Sergeant, who in private life is a nurseryman in Tennessee. I remarked to him "when I see that in flower I think summer is here"; he quickly replied "that is about the only way you would tell over here."

For the purpose of this talk, however, I propose including plants which begin to flower at the end of June, and thus omit such plants as *Philadelphus* and *Deutzia* which by that time are beginning to fade, but at the end I must not continue into winter, as winter-flowering plants will be dealt with as a separate subject.

It should be clearly understood from the outset that I have made no attempt to compile a list of all late flowering shrubs, and my selection has partly been governed by the availability of suitable lantern slides. I believe it would be possible to give another lecture and show a com-

pletely different set of slides, but the second selection would not include what I think are such good all-round shrubs as these.

In arranging the sequence I have attempted to classify them according to the time when the various plants would flower, but a little latitude must obviously be employed according to the situation of different gardens.

The collector of late flowering shrubs will soon realize one point which many of them have in common, and that is, they flower on the wood produced during the current year, and for this reason it is usual to cut them back severely in March or early April each year. An example to bear in mind is *Buddleia Davidii* (*variabilis*), in which the previous year's shoots are cut back in March to within two or three buds of the base, and new vigorous shoots are then produced which give large spikes of flowers in August and September. Other well-known plants which I treat in the same way are *Ceanothus* 'Gloire de Versailles,' *Hypericum patulum*, *Spiraea arborea* and *S. japonica*, *Ceratostigma Willmottianum*, and *Caryopteris clandonensis*.

Several varieties of shrubs, of which *Escallonia* 'C. F. Ball' may be taken as a typical example, will continue flowering for a long while. I have picked flowers from this very attractive red-flowered variety at odd times from June up to Christmas.

Summer-flowering Honeysuckles are well known and the one I have chosen is *Lonicera americana*, which I know better as *Lonicera grata*. An ideal subject to grow against a south or west wall, or over a supporting tree or large bush. The flowers are creamy-yellow tinged rose-purple, and are fragrant. *Lonicera Periclymenum* var. *serotina* is another late flowering variety.

Genista cinerea. A tall-growing species with masses of bright yellow flowers, which forms a most important feature in the shrub collections at Kew. It must be propagated from cuttings, and I advise cutting out the tips of the shoots frequently during the first four or five years of the life of the plant, in order to keep it well furnished and prolong its life. A near relative is *Genista virgata* which seeds freely and is a suitable plant for light shady positions, such as among thin-growing Birch trees.

Genista aethnensis. The Mt. Etna Broom. A very large shrub or small tree. If carefully trained in its young stage it will develop a straight symmetrical trunk. Not a plant for a restricted space. (Fig. 12.)

Spartium junceum. Spanish Broom. A very valuable yellow flowering shrub which flowers over a long period, and is useful for planting near the sea. The cut flowers last well in water.

Fremontia californica. This should be planted against a south wall, where it will produce large bright yellow flowers. It is now a scarce plant and is often rather difficult to keep. I have seen plants looking quite healthy at one time, which have collapsed completely within a few days.

Stewartia Malacodendron. A rare plant which is related to Camellia. There are several species of *Stewartia* in cultivation, and the one illustrated is, in my opinion, the most attractive, with large white flowers in the centres of which are masses of purple stamens. The

finest example I know of this is to be seen among the Rhododendrons in the Knap Hill Nursery near Woking. (Fig. 11.)

Zenobia pulverulenta. A plant for peaty soils which produces white, wax-like Lily-of-the-Valley flowers in July. Slow growing, but flowers in the young state.

Rhododendron discolor. There are, nowadays, several Rhododendrons which can be seen in flower long after the main show of the June hybrids. This species bears white, or delicate pink, flowers in July and is not only valuable in itself, but perhaps more so because of the influence it has on hybridization. By crossing this with other kinds a late flowering race is gradually being evolved, and I am particularly fond of the clear pink variety, 'Azor.'

Rhododendron auriculatum. Another white-flowered species, which grows into a large bush and has also been used for hybridizing to raise fine late flowered varieties. A fine hybrid between this and *R. discolor* is named 'Argosy,' while flowering a good deal later is 'Polar Bear' (*auriculatum* \times *diaprepes*) which I have seen at its best in September.

Eucryphia glutinosa. A large flowering shrub from the Andes, with large white flowers and golden anthers which are borne in great profusion when the plant has been established for several years. In my opinion this is one of the very best summer-flowering shrubs in cultivation, and although slow growing in its younger stages it is well worth waiting for. There is a famous plant of this in the late SIR HERBERT MAXWELL'S garden at Monreith in S.W. Scotland. Notable examples are also to be found in the gardens at Grayswood Hill near Haslemere. The flowers are usually followed by a fine display of coloured foliage in the autumn.

Eucryphia nymansensis. A free flowering hybrid between *E. glutinosa* and *cordifolia*, which came by chance in the fine collection of shrubs in COLONEL MESSEL'S garden at Nymans in Sussex. It is interesting in that one of its parents (*glutinosa*) is deciduous and the other (*cordifolia*) evergreen, and in common with other hybrids of this type it is never without leaves but will cast the old crop just as the new one develops. This variety is fast growing, and I have watched one which I had as a cutting in a thumb pot in 1924 develop into a tall slender specimen over 15 feet high by 1939. It is easily propagated from cuttings and will, I anticipate, soon be available in quantity.

Olearia Haastii. A New Zealand shrub with white daisy-like flowers in August which makes a good subject for odd corners, particularly in town gardens.

Cotoneaster lactea. One of the fine plants introduced from W. China by GEORGE FORREST. A strong growing evergreen species which flowers later than most of its relatives, and holds on to its masses of bright red berries until February. There is, what I think must be a plant raised from FORREST'S original introduction, in the garden at Little Haddon Hall, Woodbridge, which on measuring I found to be 15 feet high and 25 feet through the branches. I remember surprising some pheasants perched in it feeding on the berries in February.

If I had the room and were restricted to growing only six different Cotoneasters this would certainly be included. It also makes a fine

hedge plant, of which there is a good example in The Nursery at Woodbridge, and which we are most careful to cut with secateurs.

Romneya Coulteri. Popularly known as the Californian Poppy. There are two species in cultivation, this and *R. trichocalyx* and an intermediate between the two called *hybrida*. Many people find *Romneya* difficult to establish, but, once having done so, may experience difficulty in keeping it within bounds. I have even seen it pushing up through gravel paths and between paving stones. It has to be propagated by root cuttings which are usually inserted very early in the year singly in tiny pots.

Potentilla fruticosa var. *Farreri*, which I believe should now be correctly called var. *parvifolia*, is one of the finest of all low-growing yellow-flowered shrubs, giving two or even three displays from June until late September. I am fond of using this in the garden by planting it in front of *Berberis Thunbergii atropurpurea* as the contrast between the rich yellow flowers of the one with the bright bronzy-purple foliage of the other gives full value for a long time.

Hypericum patulum Forrestii. This, with the similar variety *Henryi*, provide two fine yellow-flowered small growing shrubs, and as they flower on the ends of the new summer shoots they are best cut back every March.

Solanum crispum 'Glasnevin form,' also known as *autumnale*. A very vigorous semi-evergreen plant for quickly clothing a large expanse of south or west wall, or training over a pergola. Masses of attractive bluish-purple potato-like flowers are produced throughout the summer and autumn. The plant gets to be untidy and should be drastically dealt with to keep it within reasonable bounds.

Rhus Cotinus. The Smoke Tree. The attraction of this shrub is not due to its flowers which are small, but to a mass of pinkish silky hairs which smother the whole bush in late summer and persist for several weeks. No collection of good shrubs could be without this and its coloured leaved forms. They are best planted where the soil is poor, or they develop long leafy shoots at the expense of the hair-like growths.

Senecio laxifolius. A low-growing New Zealand evergreen shrub with very attractive grey foliage and yellow daisy-like flowers. There exists considerable confusion regarding the name of this plant and it is often grown as *Senecio Greyi*, but this name belongs to a similar but lesser known plant. I like using a group of this on the corners of shrub borders, and it is a first-class plant for dry sunny banks where, when established, it will smother all weeds.

Sambucus canadensis var. *maxima*. An American Elder with immense heads of white flowers measuring up to 14 inches across. An effect of luxurious vegetation is provided from this shrub if the previous season's shoots are cut back to within say two buds of the base in March and the new growths thinned out to leave only a few. The result of this treatment can be further enhanced by mulching with farmyard manure.

Catalpa bignonioides. Indian Bean. I could not resist including this plant, although strictly speaking it is a tree. In my opinion the display it gives is only surpassed by that of the Horse Chestnut in bloom. There are several fine examples in London which produce large

clusters of flowers with yellow and purple markings. The nurseryman finds it a difficult plant to grow in the young stages as it is liable to be severely crippled by spring frosts, with the result that several attempts may be necessary before a good leading shoot is developed.

Clerodendron trichotomum and *C. Fargesii*, are two late flowering strong growing shrubs for sunny positions. When the flowers fall they are succeeded by bluish berries set off by the persistent calyx, which turns to a maroon colour in *trichotomum* and reddish in *Fargesii*. An unusual and striking effect.

Hydrangea Sargentiana. A tall-growing shrub seen at its best in thin woodland, as at Westonbirt. The leaves are very large, and the flowers which are produced in flat heads are mainly bluish but with white sterile flowers around the outside of the inflorescence.

Hydrangea opuloides varieties. These are still more generally known as *Hortensis* varieties, and are much too numerous to deal with in detail. The massed groups of these at Grayswood Hill display them to perfection. The *Hydrangeas* grown in pots and sold in large quantities by florists belong to this group.

Hydrangea serrata, of which the varieties *acuminata*, *intermedia* and *rosalba* are generally cultivated, provide us with valuable low-growing late flowering shrubs with heads of flowers in which the contrasts between the fertile ones and surrounding sterile ones are very marked. The foliage of *acuminata* and *intermedia* takes on attractive bronze-purple tints in the autumn.

Hydrangea paniculata. This is the wild form from which the very popular variety *grandiflora* has been evolved, and deserves to be much more widely grown. Both fertile and sterile flowers are borne on the same head and this gives a much lighter effect than can be obtained from the variety *grandiflora*, which has no fertile flowers. The plants should be severely pruned in March and the new shoots reduced in numbers so that their vigour is restricted to building up large heads of flowers. Few shrubs give such a long display in late summer and autumn.

Hydrangea arborescens var. *grandiflora*, at Grayswood Hill, where this plant is usually cut almost to ground level every March. New growth quickly develops, and the large heads of sterile creamy-white flowers last for nearly two months in late summer and early autumn.

Spiraea discolor, also known as *S. ariaefolia* and *Holodiscus discolor*. A tall-growing shrub which looks at its best in the wild garden among trees, or on the edge of a pool or stream. The foam-like effect of its masses of creamy-white flowers is very striking.

Spiraea sorbifolia. One of the *Spiraeas* with foliage resembling that of a Mountain Ash. The best effect is obtained by cutting back in March almost to the base the shoots developed the previous summer. The upright plume-like heads of white flowers are in pleasant contrast to the decorative leaves.

Spiraea Lindleyana. Larger growing than the previous one, with very large plumes of white flowers and luxurious fern-like foliage. This section of the genus provides, in my opinion, ideal plants for backing up a large herbaceous border as their habit of growth and lovely foliage blends with herbaceous plants. It should be stressed again that severe

pruning in March, coupled with restricting the number of shoots per plant and mulching with farmyard manure, will produce luxuriant growth which bears no resemblance to that produced by starved plants which are not pruned. (Fig. 15.)

Spiraea japonica var. 'Anthony Waterer.' A dwarf-growing form with deep pinkish-crimson flowers, making an ideal plant for grouping in front of a shrub border. It should be severely pruned back in March.

Hypericum 'Rowallane Hybrid.' The name Rowallane is a hall mark for any plant, and in this instance MR. ARMYTAGE-MOORE has distributed a lovely autumn flowering hybrid *Hypericum* with large deep yellow flowers borne on the ends of the current year's shoots. The plant will die back to the root stock in severe winters, but usually springs up again in June (Fig. 14.) *Hypericum Rodgersii* is another late flowering member of this lovely genus.

Rosa 'Nevada.' A remarkable hybrid between 'La Giralda' and *Moyesii* which grows to about 7 feet high and produces numerous very large creamy-white flowers which are flesh-coloured in the bud stage. The mass of yellow stamens in the centre of the flowers adds to their attraction. (Fig. 6.)

Escallonia montevidensis. Mention has already been made of the variety 'C. F. Ball' which continues to bloom over a long period, but this South American evergreen species does not commence to open its attractive white flowers until September. It is usual to plant it against a wall. A chance hybrid said to be between *montevidensis* and *exoniensis* appeared in the garden at Caerhays Castle in Cornwall, and has been named *Iveyana* after one of the gardeners. This is one of the best evergreen flowering shrubs I know, the foliage is dark green and shining.

Buddleia Fallowiana var. *alba*. A low-growing Chinese plant with very attractive greyish-white foliage and whitish flowers. I find this an ideal plant to include in a shrub border where the effect requires lightening.

Buddleia Davidii, more generally known as *B. variabilis*, of which there are several fine named varieties, such as 'Île de France,' 'Royal Red' and 'Fromow's Purple.' With such first-class varieties as these available it is difficult to understand why one so often sees worthless forms in gardens which are just chance seedlings. This is the plant which I took at the beginning to stress the point about severe pruning in March, and it is perhaps remarkable that the drastic treatment advised results in new shoots several feet in length being produced again by the early autumn.

Cerastostigma Willmottianum, often called the Hardy Blue Plumbago is one of my favourite plants. A low-growing shrub which I always cut almost to ground level in early April, following which it produces numerous new shoots which attain a height of nearly 2 feet by August. Numerous bright blue flowers are borne from August until the first hard frost in the autumn. An ideal subject for a sunny well-drained position, and can be used as an edging plant. I have planted it in front of *Fuchsia magellanica* var. *Riccartonii* with pleasing results.

Magnolia grandiflora. This can scarcely be called a shrub, but justifies inclusion because throughout the autumn it produces its

exquisite waxy-white flowers. The form known as 'Exmouth variety' appears to be most reliable in producing flowers. The purchase of plants raised from seeds should be discouraged as the numerous instances of *Magnolia grandiflora* which have reached considerable age without flowering can usually be traced back to the fact that these were raised from seeds.

Campsis grandiflora (*chinensis*). This is a name which I have difficulty in using as I first became acquainted with this lovely climbing plant as *Bignonia grandiflora*, and at times have used its other name of *Tecoma*. However, the mixed nomenclature in no way detracts from the plant, and when I see its large orange-red trumpets in September I always think it has somehow escaped from an old-time conservatory. It should be given a favoured position against a south wall, where it will climb up to 20 feet, and pruned back after the manner of an ornamental Vine every spring.

Campsis radicans. Hardier than *chinensis* with orange-scarlet flowers, and should be selected where there is fear about planting the more tender species. I have seen a wonderful specimen of this completely covering the roof of a large shed in a garden near Bicester, and there is a fine plant which seems to grow out of the pavement about 100 yards from my home in Woodbridge, and is the object of much interest every September.

Hibiscus syriacus elegantissima. In my opinion, there are too many varieties of *Hibiscus syriacus* in cultivation, and I would advise concentrating on selecting the very best of each particular shade of colour in both the single and double forms. I would ruthlessly discard some of the double kinds with indefinite-coloured flowers, which look at their worst following a late summer shower of rain. The best single-flowered red variety is undoubtedly 'Woodbridge' (Fig. 10), and a good blue form is 'Coeleste,' and a white 'Snowdrift.' No garden should be without a few of these as they bring colour to the shrub border when it is most needed. They like full sun and a well-drained soil, and are notoriously slow in making new growth after transplanting.

Clematis. The main flowering of the so-called large flowering hybrid *Clematis* is over before late summer, but those varieties which bloom on the summer growth must be remembered when thinking out schemes for planting late flowering shrubs, while the two yellow flowered species, *orientalis* and *tangutica*, should not be overlooked.

Ceanothus 'Gloire de Versailles.' This lovely blue-flowered variety is still the most popular among the summer flowered hybrids, although others such as 'Henri Defosse,' 'Perle Rose' and 'Topaz' should also be planted. I like to mass these plants where there is room and prune them severely in March. (Fig. 13.) Fine examples of these are to be seen near the Temperate House at Kew. They may also be planted against walls facing south or west, where such drastic treatment is not required, and this perhaps would be the best plan for such kinds as 'Henri Defosse' in cold districts. I would always find room on a wall for the evergreen *Ceanothus* 'Autumnal Blue,' which will flower from August to December, and *C. Burkwoodii* which gives an autumn as well as a spring display.

Veronica elliptica var. 'Autumn Glory,' as its name implies, flowers

throughout the autumn, and is a low-growing evergreen suitable for edging, with bright violet-purple flowers. This is more hardy than the more brightly coloured varieties of *Veronica speciosa*, which are such a feature of South Coast gardens but which cannot be relied upon to withstand inland winters.

Ericas, Callunas and Daboecias. An illustrated lecture could be given on these alone as they are so numerous, but where the soil is suitable gardens would be very poor where a selection of summer flowering heathers was omitted. To have flowers to coincide with the period taken as the commencement of this talk, *Erica ciliaris*, *cinerea* and *Tetralix*, and varieties of these, would have to be included, followed by *vagans* (the Cornish Heath), of which the variety 'Mrs. D. F. Maxwell' is the best.

Calluna would be represented by such varieties as *Alportii* (deep crimson), *Hammondii* (a fine "white heather") 'H. E. Beale'—a lovely double form with very long spikes of bright pink flowers, and 'J. H. Hamilton,' a dwarf with double pink flowers.

Daboecia is the Irish, or St. Dabeoc's Heath, and there are forms with crimson-purple, white and parti-coloured flowers. The massing of Heathers to smother weeds is worth remembering.

Punica Granatum. The Pomegranate, about which there has recently been considerable correspondence in *The Times*, should be planted preferably against a south or west wall where, although it may not produce fruits, it will nevertheless repay for planting because of its unusual bright scarlet flowers.

Tamarix, generally called Tamarisk, of which the best autumn flowering kinds are the pink-flowered *pentandra* (sometimes called *hispida aestivalis*), and the new darker form *rubra*. It is essential to cut back these plants in March almost to the base of the previous year's growth, and this treatment will result in the development of new shoots from 4 to 5 feet in length, on the ends of which large feathery heads of flowers will be borne.

Colletia cruciata sometimes called The Anchor Plant, because of the resemblance of its flattened branches to an anchor. A very spiny whitish-flowered shrub which may appeal only to collectors of the unusual.

Yuccas. No autumn garden of flowering shrubs is worthy of the name if *Yuccas* are not included, and the three species most usually seen are: *filamentosa*, which is hardy and has thread-like filaments breaking away from the margins of its leaves. The flowers are yellowish-white produced on upright panicles which may reach a height of 6 feet. *Y. gloriosa* (Adam's Needle), is the plant seen more frequently in south and west country gardens; the leaves are stiff in habit and often are borne at the top of a stout woody stem. The flowers are creamy-white, hanging downwards and may be tinged with red or purple on the outside. *Y. recurvifolia*, similar to *gloriosa*, but with recurved foliage is the species most usually cultivated.

Coronilla glauca, photographed in full flower in November, although it is usual to see it at its best in May and June. This has particularly attractive greenish-blue foliage and masses of yellow pea-shaped

flowers. It should be given a hot, sunny position at the foot of a south wall.

Arbutus Unedo. The well-known Strawberry Tree, which may be an intruder as it flowers on into winter. A large evergreen bush or tree with bell-shaped whitish-pink flowers, sometimes followed by strawberry-like fruits, which although edible are not attractive to eat.

I feel I cannot leave this subject on the note that with the last of the shrubs to finish flowering there is nothing else to live for in the garden and so I have included two coloured slides, the first showing a great mass of berries on *Pyracantha coccinea* var. *Lalandii* grown as a bush, and the last *Prunus Sargentii* in the full splendour of its autumn foliage.

FURTHER NOTES ON WORSLEYA PROCERA

Syn. HIPPEASTRUM PROCERUM

Major Albert Pam, O.B.E., M.A., F.L.S., V.M.H.

IN November 1943 I described in this JOURNAL the flowering of a bulb of the above species which I had been growing for six years. The same bulb flowered regularly at the same season, early August, for three more years and then I made the mistake of wishing to help my plant by improving the drainage and providing some fresh rooting material. (Fig. 17.) In doing this, in spite of the greatest care, I broke off a large main root; a smaller root was left and I packed round this the fibrous material described in my previous article, and hoped for the best.

Here I must digress to describe the root system of this plant about which I can find nothing in the literature. The plant is supplied with several long thong-like main roots, almost black and of a diameter of about 8 mm., that is thicker than an ordinary lead pencil. These roots, which originate from around the basal plate appear to be holding or anchoring roots. The plant normally grows on the rocky slopes of the Organ Mountains near Rio de Janeiro and a strong rooting system is necessary to hold the plant upright in such exposed positions. But when I accidentally broke off one of these thick roots, I found that, arising from it were a mass of other roots of a light brown colour and of the thickness of about 1 mm. These small brown roots spread in large masses from the main root and are evidently the feeding roots, through which the plant derives its nourishment.

It has been said that the main holding roots of this plant travel over the surface of the rocks until they find a crevice, into which they enter. In these crevices there is usually an accumulation of humus, and I imagine that when the thick root meets this, it produces these masses of feeding roots. In a similar way, roses produce thong-like roots to hold the plant in position and from these issue a mass of fibrous roots which supply the food.

After this digression I must revert to my plant which again this year, 1949, but two months later than before, sent up a fine scape with six perfect blue flowers. It must therefore have recovered from the injury I unfortunately inflicted on it; this flowering was a little over three years after the last. However, I fear that this particular plant is not in good

health owing to insufficient drainage in its pan, due to the fact that when it was re-potted, I could not get any *Osmunda* fibre. This has now been remedied, but it will be several years before the plant recovers sufficiently to flower again. But I have several young plants coming along very well and one or more of these will, I hope, soon reach flowering size.

AMARYLLIS BELLADONNA AND NERINE BOWDENI

N. K. Gould

AMONG the many interesting and beautiful South African perennial plants which have enriched British gardens few have proved so accommodating as the Belladonna Lily. Planted in a well-drained border where shelter from wind and hard frost can be provided for the tender young leaves appearing in early winter, it will flourish without much attention for some years, until overcrowding of the large bulbs makes replanting necessary. While the foliage is developing it delights in full exposure to sunshine, and the unusual abundance of flower at Wisley last October is doubtless attributable, in part, to the exceptionally sunny summer weather. (Fig. 2.) Some credit should be allowed, however, to a fortuitous water-supply from a leaking underground pipe which must have sustained the roots through many rainless weeks and assisted the development of the flowers.

The name *Amaryllis Belladonna*, which we are accustomed to associate with the Cape Belladonna Lily, was first used by LINNAEUS for one of the nine species of *Amaryllis* in the first edition of his *Species Plantarum* (1753). Botanists have for some years doubted whether LINNAEUS intended the name to apply to the Cape plant, for his description was vague, the habitat was stated to be the Caribbean Islands, Barbados and Surinam, and he cited synonyms which evidently referred to the American plant generally known at the present time as *Hippeastrum equestre*. PROFESSOR J. C. UPHOF, reviewing all the available evidence in *Herbertia*, Vol. 5 (1938) reached the conclusions that the plant called *Hippeastrum equestre* should in future take the name *Amaryllis Belladonna* and that the name *Callicore rosea* must be revived for the Cape Belladonna Lily. In the following year, MR. J. R. SEALY, of Kew, discussed the whole matter in very full detail in the *Kew Bulletin* (No. 2, 1939), showing that the name *Amaryllis Belladonna* was based upon a plant of the Cape Belladonna Lily "with which was confused the literature relating to the American plant," and that the name *Amaryllis* must be retained for the Cape plant (contrary to PROFESSOR UPHOF's conclusion that the genus *Hippeastrum* must be renamed *Amaryllis*).

Nerine Bowdeni, another valuable autumn-flowering South African bulb, has been in cultivation in this country for about forty-five years. Given the treatment recommended for the Belladonna Lily it may be relied upon to grow and flower freely every year. The photograph shows a variety of slightly darker colouring than the ordinary type, and there is also a taller and more robust form known as 'Fenwick's Variety.' (Fig. 1.)

A NEW GLORIOSA (*G. VERSCHUURII*)

Thomas Hoog

SOME years ago, when visiting the Amsterdam Botanic Gardens, I noticed a group of *Gloriosas* labelled *G. Rothschildiana* which seemed different from the plants generally grown under this name. The tubers which were given me have increased rapidly, and cultivation of the Amsterdam plant side by side with *G. Rothschildiana* has confirmed this impression. As the distinguishing characters remain constant when the Amsterdam plant is raised from seed, I have no hesitation in calling it a new species:—

***Gloriosa Verschuurii* Th. Hoog, sp. nova.** *Herba* glabra scandens ad 150 cm. alta. *Folia* sessilia, opposita vel terna, anguste ovata vel lanceolata, ad 20 cm. longa, 7·5 cm. lata, acuminata, apice cirriferà. *Flores* speciosi, cernui, laxè corymbosi. *Pedicelli* 9–15 cm. longi, sub apice abrupte deflexi. *Segmenta perianthii* reflexa sed vix recurvata, oblanceolata, acuta, parte inferiore involuta, parte superiore leviter undulata, 5–6 cm. longa, 1·6–2 cm. lata, coccinea, basi et margine lutea. *Filamenta* viridia, 3·3–5 cm. longa; *antherae* virides, post dehiscentiam 10 mm. longæ, *pollen* aurantiaco-brunneum. *Stylus* viridis, ad 3–5 cm. longus. *Patria* ignota; specim. authent. in Herb. Kew., L. H. BAILEY Hort. (Fig. 16.)

This new *Gloriosa* is a compact growing plant, reaching a height of about 5 ft. (150 cm.) while *G. Rothschildiana* alongside it is up to 8 ft. (250 cm.). The leaves of *G. Verschuurii* have a tendency to be broader and possess more robustly acuminate tips than those of *G. Rothschildiana*. The pedicels of *G. Verschuurii* are shorter than those of *G. Rothschildiana*, being 10–15 cm. instead of 20–25 cm. long. Immediately below the perianth the pedicel bends over abruptly at an angle of about 90° whereas in *G. Rothschildiana* the pedicel curves gradually at the tip. The position of the flowers in relation to the stem is about the same in both species. The perianth-segments are reflexed as in all *Gloriosas*. They are, however, straight rather than recurved in *G. Verschuurii*, so that their tips do not touch but stand well away from each other, and their greatest width is about two-thirds from the base, whereas in *G. Rothschildiana* the segments are definitely recurved and have their greatest width at the middle. The colour pattern of the two is the same but the crimson of *G. Verschuurii* is slightly more intense and its yellow somewhat deeper in tone. The undulate margins so marked in *G. superba* and less evident in *G. Rothschildiana* are present in *G. Verschuurii* but not so pronounced. The country of origin of *G. Verschuurii* is unknown. *G. Rothschildiana* is a native of Uganda, and *G. Verschuurii* may likewise come from East Africa.

It is with the greatest pleasure that I dedicate this new species to my friend, MR. JAN VERSCHUUR, the able curator of the Amsterdam Botanic Gardens. His love for the collection of plants entrusted to his care and his tenacity overcame all difficulties during the blackest months of the German occupation in the winter of 1944 and spring 1945 and it is thanks to him that this collection, which generations have brought together, was saved from destruction through want of fuel and through neglect.

At the Zwanenburg Nurseries in Haarlem we have grown a large stock of *G. Rothschildiana* under glass and hundreds of flowers are cut during the season. Also we have *G. Carsoni* with yellow and violet flowers which grows even taller, and *G. Plantii* (*G. virescens* var. *Plantii*) with small orange flowers. *G. superba* does not seed readily here and is not so easily managed. The rare *G. superba lutea* is represented by a few specimens. MR. C. S. GARNETT's hardy *Gloriosa* described in R.H.S. JOURNAL, 69, 338, fig. 114 (Nov. 1944), for which no name has been found yet, differs from the others, while a new stock of *G. superba* raised from seeds from South Africa is another puzzle. It is nearer to "true" *G. superba* than any others, but not exactly the plant which has been figured so beautifully in G. VOORHELM SCHNEEVOOGT, *Icones Plantarum Rariorum* t. 35, published at Haarlem in 1793, and in many other publications.

I am indebted to MR. W. T. STEARN and MR. W. VAN DIJK for help in drawing up the above description.

A TRIPLOID KNIPHOFIA*

E. K. Janaki Ammal, D.Sc.

THE genus *Kniphofia* has attained a prominent place in English gardens since the introduction in 1707 of the first and best-known species, *K. Uvaria* (*K. aloöides*), the Red-hot Poker. As early as 1874 J. D. HOOKER mentions seven out of the then known sixteen species as being in cultivation in this country. The number of species indexed today is 93, of which 56 are South African, 16 generally distributed in Tropical Africa, and 8 Abyssinian. Kenya, the Belgian Congo and Madagascar each have 2 species, while the genus is represented by single species in the Sudan, Rhodesia, Griqualand, Nyasaland, Uganda, Eritrea and in Yemen in Arabia. The genus is thus interesting geographically because, like *Gladiolus*, *Aloë*, *Philippia* and *Moraea*, it has its maximum development of species in S. Africa, and is represented in Abyssinia and other mountainous regions of Tropical Africa by endemics. In vegetative characters *Kniphofia* ranges from broad-leaved, aloe-like, caulescent forms, such as *K. Northiae* and *K. caulescens*, to small grass-like types, such as *K. rufa*, *K. modesta* and *K. brevifolia*.

Kniphofias are generally self-sterile; in their native homes the large-spiked species are pollinated by honey birds and the smaller by moths and butterflies. It is not surprising, therefore, that many hybrids have arisen in cultivation.

In October, 1916, MR. J. D. SNOWDEN, of the Department of Agriculture, Uganda, found a new *Kniphofia* growing amongst short grass and scrub on the slopes of Mount Elgon, Uganda, between 8,000 and 10,000 feet. This plant was named *K. Snowdeni* after him and described by C. H. WRIGHT in the *Kew Bulletin*, 1919, page 264. In 1918 seeds of

* Contribution from the Cytological Department, R.H.S. Gardens, Wisley, No. 2.

this species were collected in the same locality by MR. R. H. DUMMER. The seedlings flowered the next year at Kew and were figured in the *Botanical Magazine*, t. 8867. This plant, however, turned out to be a much larger one than that collected by SNOWDEN, on which the original description was based. While in the original plant the leaves were 1 foot long, in the Kew seedling they were 2 feet. The length of the peduncle was 5 feet as against 1 foot in the type. Leaf-width being one of the chief diagnostic characters separating species in *Kniphofia*, the Kew seedling proved a difficult child; it had leaves three times as broad as the type. However, MR. SNOWDEN, who saw the seedling in flower at Kew recognized his plant and assured Kew that "such dimensions were often attained in the wild." This is borne out by his specimen No. 944 collected on Mount Nkokonjeru in 1924 which was 2-6 feet high.

Kniphofia Snowdeni, which is easily propagated vegetatively by runners, found its way into many gardens in England. It has a characteristic loose raceme of long orange flowers that can be easily distinguished from all other species by a well-marked constriction of the perianth tube above the ovary, like a *Gasteria* (Fig. 4). Its nearest ally is *K. longistyla*, a Nyasaland species.

In COL. F. C. STERN's garden at Highdown, Goring-by-Sea, there is a plant of *Kniphofia Snowdeni* which corresponds in all respects to the plant described in the *Botanical Magazine*, t. 8867. All the species of *Kniphofia* so far examined have 12 chromosomes, with the exception of *K. Uvaria*, in which forms with 13 chromosomes have been recorded by WEBBER (see *The Chromosome Atlas*, by C. D. DARLINGTON and E. K. JANAKI AMMAL). The Highdown plant had 18 chromosomes. Each of the six chromosomes, the basic number in the genus, was represented three times. The *K. Snowdeni* of English gardens is therefore a triploid, the first one recorded in the genus. The pollen fertility of the Highdown plant, as also that of the one figured (Fig. 4) which came from the Old Court Nurseries, Colwall, Malvern, was low—about 20 per cent.—as is to be expected in a triploid.

It seemed to me very probable that the smaller plant, collected by MR. SNOWDEN and described as the type, was a diploid, in which case its pollen fertility would be normal; also that there probably existed in the region of distribution of this species giant triploid, or even tetraploid, forms similar to the Kew seedling, which would be easily detected by their chromosome and pollen counts. To test this it was essential to get living material from Mount Elgon or to examine herbarium material for pollen-counts, and the latter proved possible at the Kew Herbarium through the kindness of the Director and Keeper. I give below a brief summary of my findings from ten herbarium sheets representing wild collections from 1916 to 1936. (It is possible to differentiate good pollen from bad under the microscope, even when taken from dried herbarium sheets, by their differential staining when heated in acetocarmine.)

It will be seen from the table below that my first prediction was fulfilled. The *K. Snowdeni* type specimen No. 437, DUMMER No. 3573 (which very probably was the one from which the seeds were collected and sent to Kew), and three others of similar size had pollen with 80 per cent. or over fertile grains—and are probably diploids. Secondly, three

POLLEN FERTILITY OF <i>K. SNOWDENI</i>							
WILD COLLECTED MATERIAL							
Collector	No.	Date	Locality	Elevation in ft. where known	Height of Plant in ft.	Percent- age Pollen Fertility	Pre- sumed Ploidy
1. Snowden	437	Oct. 1916	Mt Elgon, Uganda	8000-10,000	1	80	2x
2. Dummer	3573	Jan. 1916	Mt Elgon Uganda	9000-10,000		85	
3. Snowden	944	Dec 1924	Mt Nkokonjeru	7000	2-6	99	
4. Chester Jack	306	Aug 1932	Londiana, Kenya		1	96	
5. Lugard	431	Dec. 1930	Mt Elgon, Kenya	13,000	2	83	
6. Lugard	83	Dec. 1930	Mt Elgon		10	95	4x
7. Miss Mainwaring	42	Nov. 1936	Hoeys Bridge, Mt. Elgon		8-12	90	
8. Libenburg	1719	Apr. 1930	Mt Elgon		"large"	10	
9. Dale	2800	May 1932	Londiana, Kenya		3	19	3x
10. Miss Mainwaring	40	Nov. 1936	Hoeys Bridge, Mt. Elgon, Kenya		6-7	16	
GARDEN MATERIAL							
Original Kew Plant from Dummer's Seed					5	23	3x
Highdown, Goring-by-Sea.					5	22	
Wisley					3½	20	
R.H.S. Exhibit (Old Court Nurseries)						23	

collections from Mount Elgon, similar in size to the triploid *K. Snowdeni* of English gardens, had, like it, highly sterile pollen (10-19 per cent. good). Finally, and unexpectedly, amongst the forms with good pollen there were two of gigantic size (Nos. 6 and 7 in table) with pollen twice the size of ordinary diploids. These almost certainly are tetraploids. The two collections made by MISS MAINWARING at Hoeys Bridge, Mount Elgon (No. 40 with 16 per cent. and No. 42 with 90 per cent. fertile pollen grains), seem to add evidence that sterile triploids occur in nature side by side with diploids or tetraploids.

How did the triploids and tetraploids arise?

Examination of normal diploids in *Kniphofia* shows that, associated with the usual-sized pollen grains, are giant ones which are "unreduced" grains. About 4 per cent. of these were found in some of the specimens I examined. MOFFETT (*J. Genet.* 25, p. 315) who studied them in *K. Nelsoni*, found that they have twice as many chromosomes as ordinary pollen. Chance fertilization of a normal haploid (6 chromosome) ovule with diploid pollen (12 chromosomes) would give rise to our triploid *K. Snowdeni* with 18 chromosomes. Similarly, the union of two unreduced germ cells would give a tetraploid. Fertilization between diploids and tetraploids is another way in which these triploids might have arisen. A more detailed account of chromosome behaviour in *K. Snowdeni* will be published elsewhere.

This is not the first time that giant triploid seedlings, arising spontaneously from a diploid, have puzzled the systematic botanist. A seedling of *Rhododendron diaprepes* had been the subject of much controversy between *Rhododendron* experts till on examination at Wisley it was found to be a triploid ($2n = 39$) with the characteristic vigour and vegetative growth associated with triploidy.

A list of *Kniphofia* species examined for chromosome counts at Wisley is given below. Those marked * are included in the Chromosome Atlas. All the species listed have $2n = 12$ chromosomes, except *K. Uvaria*, which occasionally has 13 chromosomes, and the triploid *K. Snowdeni* ($2n = 18$).

1. *South African*—*breviflora*, **Burchellii*, *caulescens*, *Galpini*, *Macowani*, *modesta*, *multiflora*, **natalensis*, *Northiae*, **Nelsoni*, *praecox*, **sarmentosa*, **Uvaria*, *Zululandiae* (?).
2. *Abyssinian*—*abyssinica* (?), *comosa*, *foliosa*, **Leichtlini*.
3. *Tropical South West Africa*—*Kirkii*.
4. *Uganda and Kenya*—*Snowdeni* (12?) 18, (24?)
5. *Horticultural forms*—**corallina* (*K. Macowanii* \times *Uvaria*), *erecta*, **pulchella*, *tricolor*.

In view of the triploidy and possible tetraploidy of the giant *Kniphofia Snowdeni* it seems likely that giant forms in other species of *Kniphofia* will be found to have arisen in the same way. As the total number of species in *Kniphofia* is not very great, it is hoped that, with the co-operation of Fellows and other collectors, it will be possible to make a full survey of this interesting genus from authentic material grown at Wisley. Collectors and botanical gardens are invited to send to Wisley plants or seeds of species not included in this list.

WISLEY TRIALS, 1949

PERENNIAL ASTERS AT WISLEY, 1949

Seventy-one varieties of Perennial Asters (Michaelmas Daisies) were grown at Wisley in 1949; many of these have received awards in previous years and are grown for comparison against which new varieties are compared. The trial was finally inspected by a sub-committee of Floral "A" Committee on September 27, 1949, who made their recommendations for awards as given below. The number in brackets following the description is that under which the variety was grown in the trials.

Amellus Group

Mauve Beauty (raised and sent by B. A. Barrett, Esq., 2 Kelvin Cottages, Rushett Close, Long Ditton, Surrey). **A.M.** September 27, 1949: 2 feet; of compact, erect habit; flowers single, $2\frac{1}{2}$ inches diameter, flat, Heliotrope (H.C.C. 636), slightly flushed with Mineral Violet (H.C.C. 635/1); disc golden-yellow. (6).

Ericoides Group

Amy (raised, introduced and sent by the late Mr. H. J. Jones). **A.M.** September 27, 1949: 3 feet tall, of erect bushy habit; flowers single, $\frac{3}{4}$ inch diameter, arranged in graceful sprays, Mineral Violet (H.C.C. 635/3) on a Heliotrope ground (H.C.C. 636/3). (**H.C.** 1920.) (34).

Mrs. A. E. Underdown (raised, introduced and sent by the late Mr. H. J. Jones). **A.M.** September 27, 1949: 3 feet, of graceful free flowering habit; flowers single, $\frac{1}{2}$ inch diameter on arching sprays, Wistaria Blue (H.C.C. between 640/2 and 640/3); disc yellow passing to reddish-brown. (**H.C.** 1920.) (32).

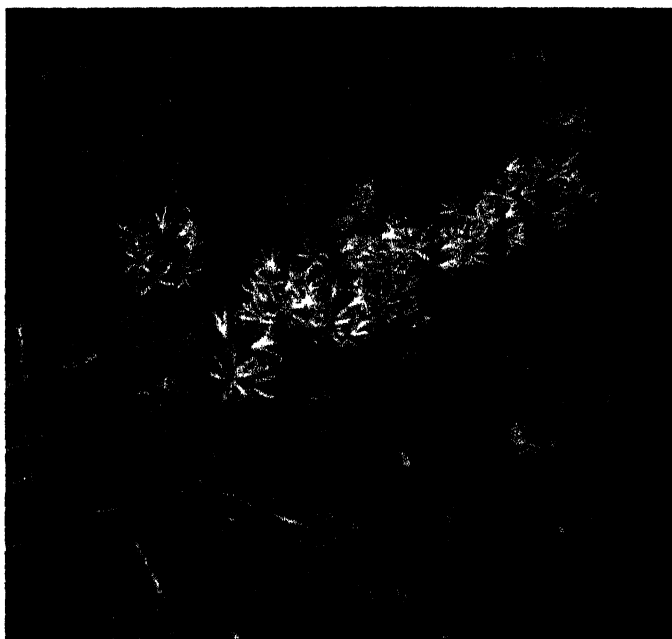


FIG. 1—*Nerine Bowden* 'Fenwick's Variety' at Wisley, 1949 (See p. 21)



Colour photographs, N. K. Gould

FIG. 2—*Amaryllis Belladonna* at Wisley, 1949 (See p. 21)

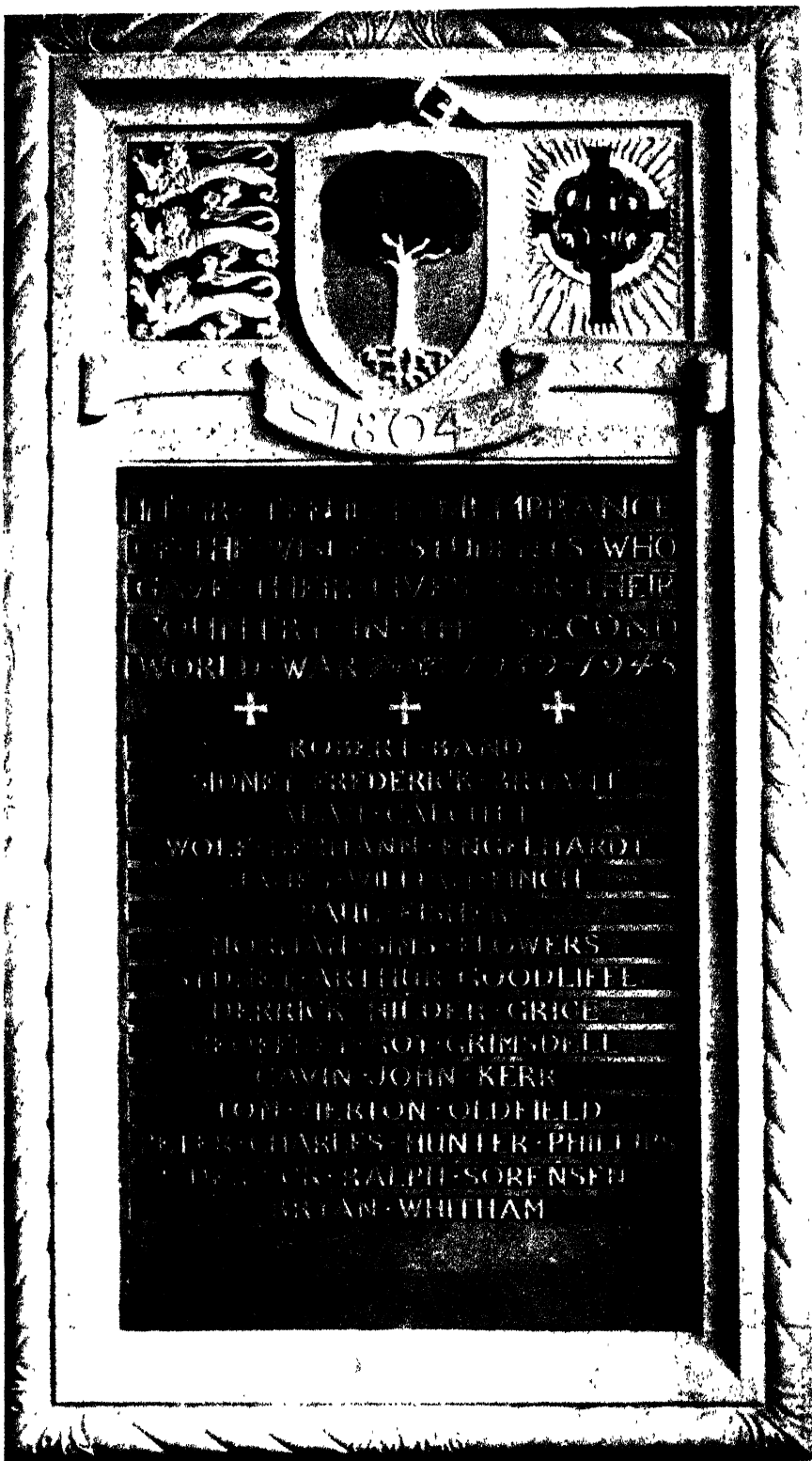


FIG. 3—The Wisley War Memorial (See p. 3)



Photo, R. A. Muthy

FIG. 4 *Kniphofia Sarcocolla*, Giant Triploid Form (See p. 24)



FIG. 5—Old fashioned Roses in LT.-COL. L. C. R. MESSELL'S garden at Nymans, Sussex
(See p. 11)



SHRUB ROSES

FIG. 6—*Rosa Moyesii* 'Nevada' (See p. 10)

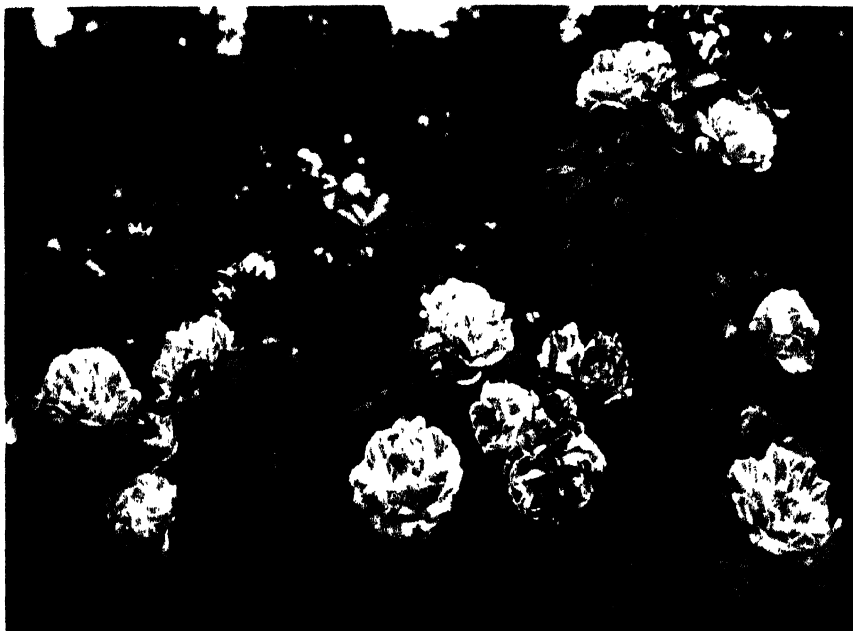
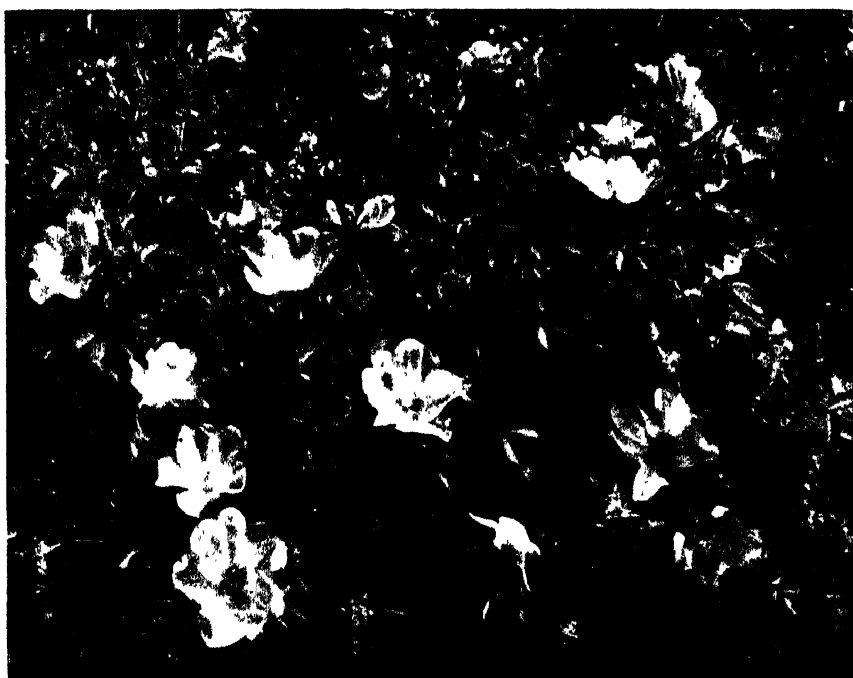
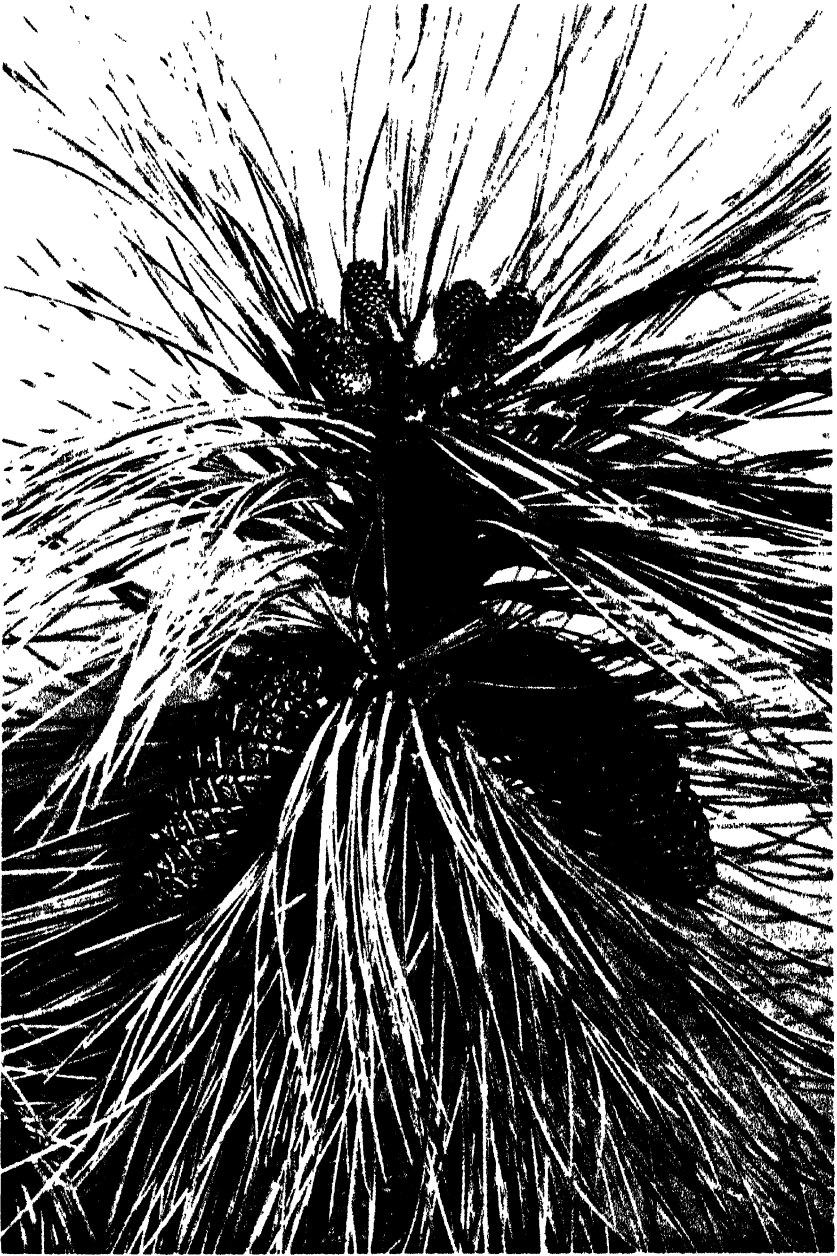


FIG. 7—Bourbon Rose, 'Honorine de Brabant' (See p. 11)



SHRUB ROSES

FIG. 8—*Rosa Pauli rosea* (See p. 8)



Photo, J. F. Downward

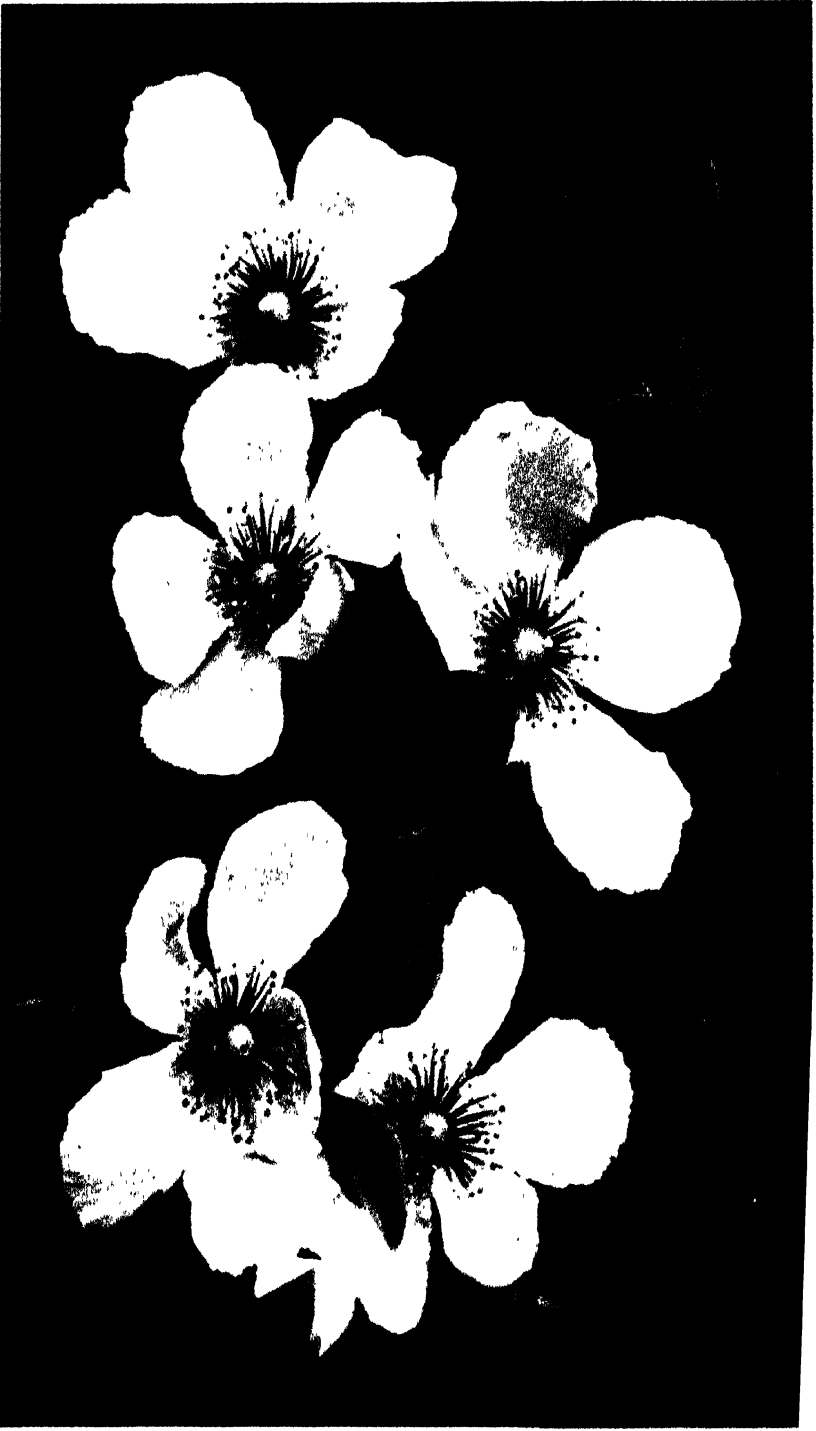
FIG. 9 - *Pinus Montezumae* glaucous form. **A.M.** October 4, 1949. Exhibited by G. H. DOWTY, 18-Q., Grayswood Hill, Haslemere, Surrey (See p. 44)



Photos, R. A. Malby

SUMMER AND AUTUMN FLOWERING SHRUBS

FIG. 10-- *Hibiscus syriacus* 'Woodbridge' (See p. 18)



SUMMER AND AUTUMN FLOWERING SHRUBS

FIG. 11—*Stewartia Malacodendron* (See p. 13)

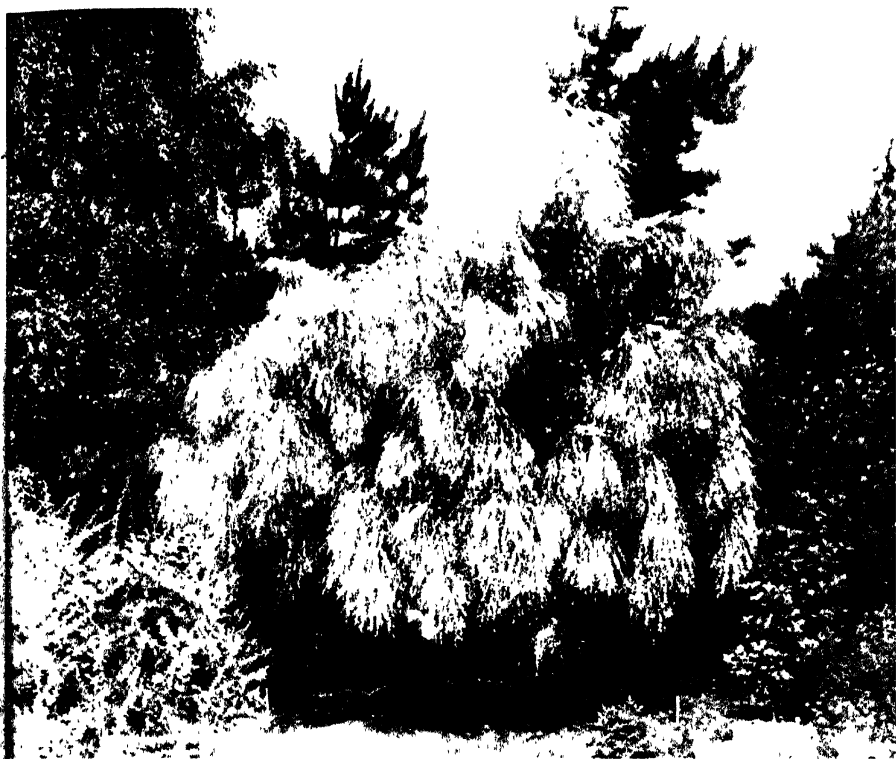


FIG. 12—*Genista aethnensis* in the late DR. STOKER'S garden at Loughton, Essex (See p. 13)

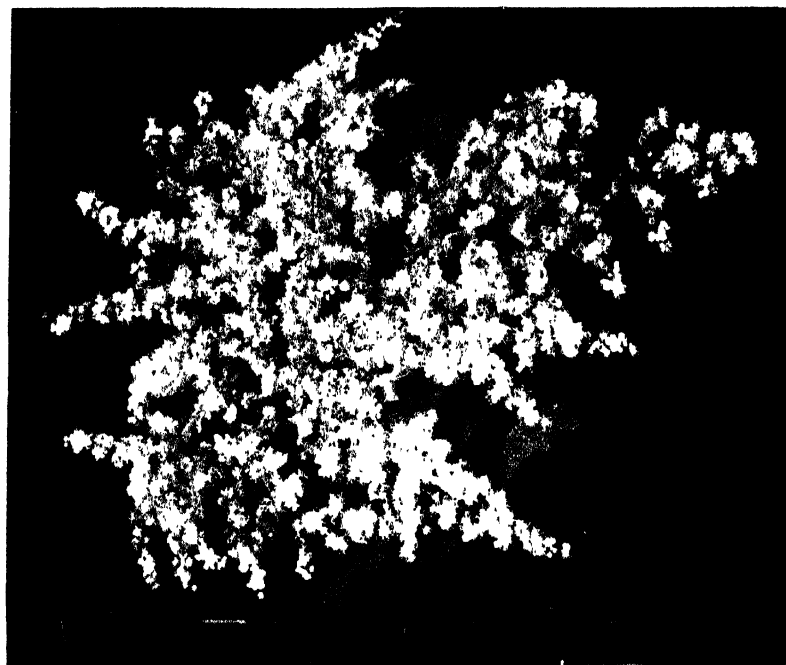


SUMMER AND AUTUMN FLOWERING SHRUBS

FIG. 13—*Ceanothus* 'Gloire de Versailles' (See p. 18)



FIG. 14—*Hypericum* 'Rowallane hybrid' (See p. 17)



SUMMER AND AUTUMN-FLOWERING SHRUBS

FIG. 15—*Spraea Lindleyana* (See p. 16)



FIG. 16. A New Gloriosa
 Left—*Gloriosa Rothschildiana* Right—*Gloriosa Verschaffii* sp. nova (See p. 22)



Photo. T. T. Downward

FIG. 17.—*Worsleya procera* A.M. October 4, 1949.
 Exhibited by MAJOR A. PAM, O.B.E., F.R.S., V.M.H. (See pp. 20, 44)



Colour drawing by A. J. Wise

WISLEY TRIALS 1949

FIG. 18 Sweet Peas which received Awards of Merit after trial, 1949. (See p. 35)

- | | | |
|------------------------|----------------------|-------------|
| 1. 'Crimson Excelsior' | 2. 'Peggy Edwards.' | 3. 'Betty.' |
| 4. 'Highland Mist.' | 5. 'Golden Jubilee.' | |

Novi-Belgii Group

Joker (raised and introduced by the late Edwin Beckett and sent by the late Hon. Vicary Gibbs). **F.C.C.** September 27, 1949: 3½ feet tall, of compact, very free flowering habit; flowers single, 1½ inch diameter, symmetrical, Phlox Purple (H.C.C. between 632 and 632/1); disc golden-yellow. (**A.M.** 1932.) (60).

Ronald (raised by the late H. Victor Vokes, introduced and sent by Messrs. Barr & Sons, King Street, Covent Garden, London, W.C. 2). **A.M.** September 27, 1949: 18 inches tall, of compact, dense free flowering habit; flowers single, 1½ inch diameter, Rose Purple (H.C.C. 533); disc dull golden-yellow. (22).

Vokes Pink (raised by the late H. Victor Vokes, introduced and sent by Messrs. Barr & Sons, King Street, Covent Garden, London, W.C. 2). **A.M.** September 27, 1949: 4 feet, of erect, very free flowering habit; flowers single, 1½ inch diameter, Phlox Purple (H.C.C. between 632/1 and 632/2); disc golden-yellow. (**H.C.** 1935.) (58).

Jean (raised, introduced and sent by Messrs. E. C. Simmonds & Sons, Verulam House Nursery, St. Albans). **H.C.** September 27, 1949: 2½ feet tall, of compact, erect habit; flowers semi-double, 1½ inch diameter, Heliotrope (H.C.C. 636), flushed Mineral Violet (H.C.C. 635); disc dull gold. (18).

Susan (raised and sent by Mrs. F. E. Dawkins, The Hoppet, Little Badon, Essex). **H.C.** September 27, 1949: 4½ feet, of compact, graceful habit; flowers single, 1½ inch diameter, Phlox Purple (H.C.C. 632) on Cyclamen Purple (H.C.C. 30); disc golden. (65).

BORDER CARNATIONS AT WISLEY, 1949

One hundred and three varieties of Border Carnations were grown at Wisley during 1949. The plants, five of each variety, were planted on October 29, 1948, and were judged by the Joint Committee of the Royal Horticultural Society and The British National Carnation Society on July 8 and 14, 1949, who made their recommendations for Awards as given below. The number in brackets following the variety, is that under which it was grown in the trials.

WHITE SELF

The following variety has been retained for future judgment: EDENSIDE WHITE (Douglas). (20).

YELLOW SELFS

The following varieties have been retained for future judgment: COTTAGE PRIMROSE (Allwood) (2), SPENCER DAVIES (Thorburn) (22).

APRICOT SELF

The following variety has been retained for future judgment: COTTAGE APRICOT (Allwood) (18).

PINK SELFS

Pink Pearl (raised, introduced and sent by Messrs. Allwood Bros. Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex.) **A.M.** July 14, 1949.—Plant vigorous, with stout stiff flower stems, 22 inches long; flowers 2½ inches diameter, freely produced, centre full; petals broad, entire, Carmine Rose (H.C.C. 621/1) suffused with Porcelain Rose (H.C.C. 620/1); calyx strong. (26).

The following varieties have been retained for future judgment: COTTAGE ROSE (Allwood) (5), COTTAGE WONDER (Allwood) (6), FRANCES SELLARS (Lindabruce) (31), PINK CLOVE (Allwood) (101).

ROSY-CERISE SELF

Downs Cerise (raised, introduced and sent by Messrs. Allwood Bros. Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **H.C.** July 14, 1949.—Plant vigorous, with stiff, rigid stems, 22 inches long; flowers 2½ inches, full centred, freely produced; petals broad, entire, Cherry (H.C.C. 722/1) with a golden sheen; calyx strong. (33).

SCARLET SELFS

W. B. Cranfield (raised and introduced by Mr. J. Douglas and sent by Messrs. Allwood Bros. Ltd., Haywards Heath, Sussex). **F.C.C.** July 14, 1949.—Described *R.H.S. JOURNAL* 73, p. 157 (**A.M.** 1947). (36).

The following variety has been retained for future judgment: **COTTAGE VIVID** (Allwood) (103).

CRIMSON SELF

Crimson Model (raised, introduced and sent by Messrs. Allwood Bros. Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **A.M.** July 14, 1949.—Plant very vigorous, with stiff, erect flower stems, 22 inches long; flowers double, 3 inches diameter, full centred; petals broad, entire, Cardinal Red (H.C.C. 822) with a sheen of Blood Red (H.C.C. 820). (87).

RUBY SELFS

The following varieties have been retained for future judgment: **COTTAGE CLARET** (Allwood) (9), **COTTAGE RUBY** (Allwood) (10).

MAUVE SELFS

The following varieties have been retained for future judgment: **DOWN'S BEAUTY** (Allwood) (88), **JEAN FROST** (Goodfellow) (39).

FANCIES

Apricot Bizarre (raised, introduced and sent by Messrs. Allwood Bros. Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **H.C.** July 8, 1949.—Plant vigorous; flower stems rigid, 18 inches long; flowers 2½ inches diameter, full centred; petals broad, entire, Barium Yellow (H.C.C. 503/2) heavily flushed with Camellia Rose (H.C.C. 622/1) and broadly flaked Rose Red (H.C.C. 724); calyx strong. (90).

Downs Glory (raised, introduced and sent by Messrs. Allwood Bros. Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **H.C.** July 14, 1949.—Plant vigorous; flower stems rigid, 24 inches long; flowers 3 inches diameter, full centred; petals broad, entire, Barium Yellow (H.C.C. 503/2) edged and flaked with bright crimson-scarlet. (89).

Downs Sunset (raised, introduced and sent by Messrs. Allwood Bros. Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **C.** July 14, 1949.—Plant vigorous, of good bushy habit; flower stems rigid, 22 inches long; flowers 2½ inches diameter, full centred; petals broad, entire, Shrimp Red (H.C.C. 616/1) splashed with Rose Madder (H.C.C. 23/1); calyx strong. (65).

The following varieties have been retained for future judgment: **CHERRY FLAKE** (Allwood) (99), **COTTAGE GEM** (Allwood) (15), **DIPLOMAT** (Allwood) (70), **FANCY MONARCH** (Allwood) (98), **SPANGLE** (Allwood) (100).

WHITE GROUND FANCIES

William Newell (raised, introduced and sent by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs.). **F.C.C.** July 8, 1949.—Described *R.H.S. JOURNAL*, 73, p. 158 (**A.M.** 1947). (45).

Sprite (raised, introduced and sent by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs.). **H.C.** July 8, 1949.—Plant vigorous, of compact free flowering habit; flower stems rigid, 20 inches long; flowers 3 inches

diameter; petals broad, entire, ivory-white lightly splashed with Scarlet (H.C.C. between 19 and 19/1); calyx strong. (48).

The following varieties have been retained for future judgment: JOHN STOBART (Allwood) (42), LANCING LADY (Lindabruce Nurseries) (46), LIBERTY (Allwood) (51).

YELLOW GROUND FANCIES

Thomas Lee (raised, introduced and sent by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs.). **A.M.** July 14, 1949.—Plant vigorous, free flowering; flower stems rigid, 16 to 18 inches long; flowers 2½ inches diameter, full centred; petals broad, entire, Barium Yellow (H.C.C. 503/2) edged and flaked Scarlet (H.C.C. 19/1); calyx strong. (55).

David Douglas (raised and introduced by Mr. J. Douglas and sent by W. G. Ferris, Esq., Woodhurst, High Warren, East Horsley, Surrey). **H.C.** July 14, 1949.—Plant vigorous, of bushy habit; flower stems rigid, 22 inches long; flowers 2½ inches diameter, freely produced, centre full; petals broad, entire, Lemon Yellow (H.C.C. 4/2) heavily splashed and edged Garnet Lake (H.C.C. 828/3); calyx strong. (62).

Friendship (raised, introduced and sent by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs.). **H.C.** July 8, 1949.—Plant vigorous, free flowering; flower stems 16 inches long, rigid; flowers full centred, 2½ inches diameter; petals broad, entire, Barium Yellow (H.C.C. 503/2) edged and flaked Crimson (H.C.C. 22/1); calyx strong. (60).

Indomitable (raised, introduced and sent by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs.). **H.C.** July 8, 1949.—Plant vigorous, compact habit; flower stems rigid, 17 inches long; flowers freely produced, full centred, 2½ inches diameter, Straw Yellow (H.C.C. 604/1) edged and heavily splashed Chrysanthemum Crimson (H.C.C. 824/2); calyx strong. (57).

Sunbeam (raised, introduced and sent by Messrs. Allwood Bros. Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **H.C.** July 14, 1949.—Plant vigorous; flower stems rigid, 22 inches long; flowers 2½ inches, full centred, freely produced; petals broad, entire, Barium Yellow (H.C.C. 503/2) lightly edged and flaked Scarlet (H.C.C. 19/1); calyx strong. (93).

Dawn Glory (raised, introduced and sent by Messrs. Allwood Bros. Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **C.** July 8, 1949.—Plant vigorous; flower stems rigid, 18 inches long; flowers 2½ inches diameter, full centred, freely produced, Apricot (H.C.C. 609/2) passing to Begonia (H.C.C. 619) edged and flaked Pansy Violet (H.C.C. 033/1); calyx strong. (102).

The following varieties have been retained for future judgment: A. A. SANDERS (Goodfellow) (63), COTTAGE JEWEL (Allwood) (16), BETTY PRESCOTT (Toms) (54), BOOKHAM FAVOURITE (Douglas) (56), HEARTSEASE (Goodfellow) (61).

PICOTEES

Picotee Fascination (raised, introduced and sent by Messrs. Allwood Bros. Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **A.M.** July 8, 1949.—Plant very vigorous; flower stems rigid, 24 inches long; flowers freely produced, 2½ inches diameter; petals broad, entire, ivory-white picotee Garnet Lake (H.C.C. 828); calyx strong. (81).

Eva Humphries (raised, introduced and sent by J. H. Humphries, Esq., 47 Hardy Lane, Chorlton, Manchester). **H.C.** July 14, 1949.—Plant very vigorous; flower stems rigid, 18 inches long; flowers 2½ inches diameter; petals broad, entire, ivory white very finely edged Beetroot Purple (H.C.C. 830/2); calyx strong. (80).

The following varieties have been retained for future judgment: CRIMSON FRILLS (Allwood) (91), PERFECTION (Allwood) (75), PIERETTE (Allwood) (82), ROSE FRILLS (Allwood) (74), TOGO (Allwood) (84).

GARDEN PINKS AT WISLEY, 1949

The following Awards have been made by the Council of the Royal Horticultural Society, after trial at Wisley, on the recommendation of the Joint Dianthus Committee of the Royal Horticultural Society, the British National Carnation Society and the Alpine Garden Society.

Allwoodii 'Victor' (raised, introduced and sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **F.C.C.** June 22, 1949.—Described *R.H.S. JOURNAL*, 74, p. 315. (**A.M.** 1948.)

Allwoodii 'Joan' (raised, introduced and sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **A.M.** June 22, 1949.—Plant vigorous, compact habit, 10 inches tall, very free flowering; flower stems rigid, 9 inches long; flowers semi-double, 2 inches diameter, flat, Rhodamine Pink (H.C.C. 527/1) flushed Phlox Pink (H.C.C. 625/2) zoned Rose Red (H.C.C. 724); calyx strong.

Allwoodii 'Winston' (raised, introduced and sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **A.M.** June 22, 1949.—Plant vigorous, of compact, bushy habit; flower stems rigid, 9 inches long; flowers double, 1½ inch diameter, freely produced, Cardinal Red (H.C.C. 822) with a flush of Currant Red (H.C.C. 821/1); calyx strong.

Dad's Favourite (sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **A.M.** June 22, 1949.—Plant vigorous, rather spreading habit; flower stems rigid, 11 inches long; flowers semi-double, 2 inches diameter, flat, open centre, freely produced, white ground laced Ruby Red (H.C.C. 827/2) and zoned Purple Maddar (H.C.C. 1028) with a velvety effect; calyx medium.

London Girl (raised and sent by F. R. McQuown, Esq., 39 Farm Avenue, London, N.W. 2). **A.M.** June 22, 1949.—Plant vigorous, of bushy habit, 14 inches tall; flower stems rigid, 10 inches long; flowers 1½–2 inches diameter, semi-double, flat, open centre, freely produced, white laced Indian Lake (H.C.C. 826/3) and zoned Indian Lake (H.C.C. 826); calyx strong.

Allwoodii 'Betty' (raised, introduced and sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **H.C.** June 22, 1949.—Plant vigorous, bushy habit, 12 inches tall; flower stems rigid, 10 inches long; flowers 1½ inch diameter, flat, open centre, semi-double, freely produced, ivory white zoned Rose Red (H.C.C. 724/1); calyx strong.

Allwoodii 'Eva' (raised, introduced and sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **H.C.** June 22, 1949.—Plant vigorous, of compact habit; flower stems freely produced, 10 inches long, rigid; flowers double, 2 inches diameter, China Rose (H.C.C. 024/1) zoned Chrysanthemum Crimson (H.C.C. 824/1); calyx strong.

Allwoodii 'Isobel' (raised, introduced and sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **H.C.** June 22, 1949.—Plant vigorous, of upright bushy habit; flower stems strong, erect, 12 inches long; flowers double, 2 inches diameter, flat, freely produced, Spinal Pink (H.C.C. 0625) with a golden sheen, zoned Chrysanthemum Crimson (H.C.C. 824/3); calyx strong.

Allwoodii 'Jean' (raised, introduced and sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **H.C.** June 22, 1949.—Plant of rather spreading habit, with rigid flower stems 10 inches long; flowers semi-double, flat, freely produced, 1½ inch diameter, white, zoned Fuchsia Purple (H.C.C. between 28 and 28/1); calyx strong.

Lilac Musgrave (raised, introduced and sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **H.C.** June 22, 1949.—Plant vigorous, of compact bushy habit; flower stems rigid, 10 inches long;

flowers single, 2 inches diameter, Fuchsine Pink (H.C.C. between 627/1 and 627/2), eye amber buff encircled with crimson; calyx strong.

London Poppet (raised and sent by F. R. McQuown, Esq., 39 Farm Avenue, London, N.W. 2). **H.C.** June 22, 1949.—Plant of compact, bushy habit; flower stems rigid, 9 inches long; flowers semi-double, 2½ inches diameter, flat, white flushed pink, zoned and laced Ruby Red (H.C.C. 827); calyx strong.

Allwoodii 'Monty' (raised, introduced and sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **H.C.** June 22, 1949.—Plant vigorous, bushy habit; flower stems rigid, 10 inches long; flowers double, 2½ inches diameter, Solferino Purple (H.C.C. 26/1) shaded darker and zoned Indian Lake (H.C.C. 826/3); calyx strong.

Murray's Laced Pink (raised by Mr. Murray, and sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **H.C.** June 22, 1949.—Plant vigorous, of bushy habit, flower stems rigid, erect, 10 inches long; flowers semi-double, 1½ inch diameter, freely produced, white laced with Garnet Lake (H.C.C. 828/1) and zoned Purple Madder (H.C.C. 1028); calyx strong.

Allwoodii 'Susan' (raised, introduced and sent by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex). **H.C.** June 22, 1949.—Plant vigorous, of very compact, bushy habit; flower stems rigid, 9 inches long; flowers semi-double, 2 inches diameter, freely produced, Amaranth Rose (H.C.C. 530) zoned Purple Madder (H.C.C. 1029); calyx strong. Late flowering.

DELPHINIUMS AT WISLEY, 1949

The following Awards have been made by the Council of the Royal Horticultural Society on the recommendation of the Joint Delphinium Committee, after trial at Wisley.

Bridesmaid (raised, introduced and sent by Messrs. Blackmore & Langdon, Bath). **F.C.C.** July 4, 1949.—Described R.H.S. JOURNAL, 71, p. 30 (A.M. 1945). Flowers pale blue and pale mauve.

Charles F. Langdon (raised, introduced and sent by Messrs. Blackmore & Langdon, Bath). **F.C.C.** July 4, 1949.—Described R.H.S. JOURNAL, 74, p. 265 (A.M. 1948). Flowers medium blue with a dark sepia eye.

Ruth Langdon (raised, introduced and sent by Messrs. Blackmore & Langdon, Bath). **A.M.** July 4, 1949.—6½ feet; flower spikes tapering, 3¼ feet long, with few strong side spikes; flowers semi-double, 3½ inches diameter, outer petals French Blue (H.C.C. 43/2) flushed Cobalt Violet (H.C.C. 634/2), inner petals Cobalt Violet (H.C.C. between 634/1 and 634/2); eye white.

Cantata (raised by Mr. C. R. Wootton, introduced and sent by Messrs. Hewitt & Co., Banbury Road, Stratford-on-Avon). **H.C.** July 4, 1949.—6 feet; flower spikes tapering, 3 feet long, with few side spikes; flowers semi-double, 3 inches diameter; Cornflower Blue (H.C.C. 742/3) touched with Bishops Violet (H.C.C. 34/2); eye white.

Delius (raised by Mr. C. R. Wootton, introduced and sent by Messrs. Hewitt & Co., Banbury Road, Stratford-on-Avon). **H.C.** July 4, 1949.—6½ feet; flower spikes tapering, 3¼ feet long, with many side spikes; flowers semi-double, 2½ inches diameter, outer petals Cobalt Blue (H.C.C. 44/1), inner Cobalt Blue (H.C.C. 44/1) flushed with Cobalt Violet (H.C.C. 634/1); eye white.

Frederick Grisewood (raised, introduced and sent by Messrs. Blackmore & Langdon, Bath). **H.C.** July 4, 1949.—6 feet; flower spikes tapering, 2½ feet long, with few side spikes; flowers semi-double, 2½ inches diameter, Cornflower Blue (**H.C.C.** 742/2), inner petals slightly flushed at base with Cobalt Violet (**H.C.C.** 634); eye small, white.

GLADIOLI AT WISLEY, 1949

One hundred and thirty varieties of Gladioli were grown at Wisley in the trials during 1949. They were planted on April 12, 1949, and were judged by a sub-committee of Floral "A" Committee on July 18, 25, and August 4, 1949, who made their recommendations for Awards as given below. The number in brackets following the variety is that under which it was grown in the trials.

FLOWERS WHITE

Helen Eaken (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **A.M.** July 25, 1949.—52 inches tall; flower spike 16-flowered, 9 out at a time, on an upright spike. Flowers 5 inches diameter, cream with a greenish tinge; early flowering. (7).

White Herald (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **H.C.** July 18, 1949.—3½ feet; flower spike 18-flowered, 8 out at a time, evenly spaced; flowers 4½ inches diameter, white with a greenish-cream throat; early flowering. (3).

FLOWERS YELLOW

Fairy Dress (Elfenkleid) (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **A.M.** July 25, 1949.—38–40 inches tall; flower spike 18- or 19-flowered, 8 out at a time; flowers 5½ inches diameter, Mimosa Yellow (**H.C.C.** between 602/2 and 602/3); early flowering. (10).

Ambra (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **H.C.** August 4, 1949.—42 to 44 inches tall; flower spike 16-flowered, 6 to 8 out at a time; flowers 4½ inches diameter, Naples Yellow (**H.C.C.** 403). (17).

Belle Jaune (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **H.C.** July 25, 1949.—36 to 40 inches tall; flower spike 20-flowered, 8 out at a time; flowers 4½ inches diameter, waved, Straw Yellow (**H.C.C.** 604); early flowering. (18).

The following varieties were deleted from the trial: **BADISCHE FLAGGE** (**A.M.** 1931) (20); **CHRYSANTHA** (9).

FLOWERS ORANGE

Aranjuez (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **H.C.** August 4, 1949.—36 to 40 inches tall; flower spike 15-flowered, 8 or 9 out at a time; flowers 4½ inches diameter, Chinese Coral (**H.C.C.** 614) overlaid Shrimp Red (**H.C.C.** 616). (25).

The following variety has been deleted from the trial: **ORANGE BUTTERFLY** (23).

FLOWERS APRICOT

Pactolus (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **A.M.** July 25, 1949.—3½ feet; flower spikes 20-flowered, 8 to 10 out at a time; flowers 3½ inches diameter, upper petals Amber Yellow (**H.C.C.** 505/2) flushed Orient Pink (**H.C.C.** 416), lower petals Straw Yellow (**H.C.C.** 604/1) with a large blotch of Dutch Vermilion (**H.C.C.** 717/1). Early flowering. (28).

FLOWERS CREAM PINK

The following varieties have been deleted from the trial: **APRICOT QUEEN** (**A.M.** 1934) (35); **MAIDEN'S BLUSH** (**H.C.** 1926) (31).

FLOWERS ROSE PINK

The following variety has been deleted from the trial: SWEETHEART (36).

FLOWERS OF SALMON SHADES

Marie Antoinette (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **A.M.** August 4, 1949.—36 to 42 inches tall; flower spike 20-flowered, 7 out at a time, upright; flowers 5 inches diameter, evenly spaced, Azalea Pink (H.C.C. 618) suffused with Porcelain Rose (H.C.C. 620/1) with a deep crimson blotch. (39).

Jeanette (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **H.C.** July 18, 1949.—48 to 54 inches tall; flower spike 20-flowered, 8 out at a time; flowers $4\frac{1}{2}$ inches diameter, rosy-salmon with a small scarlet blotch, very free and early flowering. (40).

The following variety has been deleted from the trial: ALICE TIPLADY (H.C. 1926) (38).

FLOWERS OF SALMON-PINK SHADES

Paul Véronèse (raised, introduced and sent by Messrs. M. van Waveren & Sons, Hillegom, Holland). **A.M.** July 25, 1949.—52 inches tall; flower spike 18-flowered, 6 or 8 out at a time; flowers $4\frac{1}{2}$ inches diameter, evenly and regularly spaced, Scarlet (H.C.C. 19/2) flushed Porcelain Rose (H.C.C. 620/1) flushed orange, blotched creamy-yellow. (120).

Ursus (raised, introduced and sent by Messrs. Blom & Padding, Beverwijk, Holland). **A.M.** July 25, 1949.—56 inches tall; flower spike 18- to 20-flowered, 8 out at a time; flowers 5 inches diameter, Begonia (H.C.C. 619) overlaid Vermilion (H.C.C. 18/1) faintly flushed French Rose (H.C.C. 520). (109).

Vermeer (raised, introduced and sent by Messrs. M. van Waveren & Sons, Hillegom, Holland). **A.M.** July 25, 1949.—52 inches tall, flower spikes 14- to 16-flowered, 6 or 7 out at a time; flowers $5\frac{1}{2}$ inches diameter, evenly spaced, Porcelain Rose (H.C.C. 620/1) shaded at margins and overlaid Scarlet (H.C.C. 19/1). (117).

Biedermeier (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **H.C.** July 25, 1949.—2 feet, 10 inches tall; flower spike 11- or 12-flowered, 6 out at a time; flowers $5\frac{1}{2}$ inches diameter, Carmine Rose (H.C.C. 621/1) flushed with Porcelain Rose (H.C.C. 620/1); early flowering. (43).

Goya (raised, introduced and sent by Messrs. M. van Waveren & Sons, Hillegom, Holland). **H.C.** July 25, 1949.—3 feet tall; flower spike 14- to 16-flowered, 6 or 7 out at a time; flowers $4\frac{1}{2}$ inches diameter, Porcelain Rose (H.C.C. 620/1) suffused with Scarlet (H.C.C. 19/1) with a salmon-orange sheen and a scarlet blotch feathered crimson. Early flowering. (113).

Mantegna (raised, introduced and sent by Messrs. van Waveren & Sons, Hillegom, Holland). **H.C.** August 4, 1949.—3 feet tall; flower spike 16- to 18-flowered, 6 or 7 out at a time; flowers $4\frac{1}{2}$ inches diameter, Porcelain Rose (H.C.C. 620/1) flushed Scarlet (H.C.C. 19/1) with a Begonia (H.C.C. 619/1) sheen, blotched Scarlet (H.C.C. 19) on lower petals. (123).

The following varieties have been deleted from the trials: AMOR (**A.M.** 1931) (49); CHERRY GLOW (41); NORMANDY (48).

FLOWERS OF ORANGE-SCARLET SHADES

Circe (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **F.C.C.** July 25, 1949.—Described R.H.S. JOURNAL 74, p. 31 (**A.M.** 1948). (66). Early flowering.

Johan van Konynenburg (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **A.M.** August 4, 1949.—Described R.H.S. JOURNAL 74, p. 31 (**H.C.** 1948). (60).

Je Maintiendrai (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **A.M.** July 25, 1949.—Described R.H.S. **JOURNAL** 74, p. 31 (**H.C.** 1948). (61).

New Europe (raised and introduced by Messrs. Blom & Padding, Beverwijk, Holland and purchased by the Society). **A.M.** August 4, 1949.—4 feet tall; flower spike 18-flowered, 7 out at a time; flowers $5\frac{1}{2}$ inches diameter, Mandarin Red (H.C.C. 17) flushed Dutch Vermilion (H.C.C. 717/2). (59).

Titian (raised, introduced and sent by Messrs. M. van Waveren & Sons, Hillegom, Holland). **A.M.** August 4, 1949.—4 feet tall; flower spike 16- to 18-flowered, 7 or 8 out at a time; flowers 5 inches diameter, Vermilion (H.C.C. 18 passing to 18/3) with a large scarlet blotch. (118).

Hondecouter (raised, introduced and sent by Messrs. M. van Waveren & Sons, Hillegom, Holland). **A.M.** July 25, 1949.— $4\frac{1}{2}$ feet tall; flower spike 16- or 18-flowered, 6 out at a time; flowers $5\frac{1}{2}$ inches diameter, Begonia (H.C.C. 619) shaded Vermilion (H.C.C. 18) with large golden-peach blotch on lower petals. (126).

Biarritz (raised, introduced and sent by Messrs. Blom & Padding, Beverwijk, Holland). **H.C.** August 4, 1949.—44 inches tall; flower spike 16- to 18-flowered, 6 or 7 out at a time; flowers 5 inches diameter, Vermilion (H.C.C. between 18 and 18/1) on a Porcelain Rose ground (H.C.C. 620). (104).

The following varieties have been deleted from the trials: **JOHN PETTITT** (**H.C.** 1937); **POTGIETER** (58).

FLOWERS OF SCARLET SHADES

Atlantic (raised, introduced and sent by Messrs. Blom & Padding, Beverwijk, Holland). **A.M.** July 25, 1949.— $4\frac{1}{2}$ feet tall; flower spike 16- or 18-flowered, 6 or 7 out at a time; flowers 6 inches diameter, Mandarin Red (H.C.C. 17), inner petals paler and outer petals Dutch Vermilion (H.C.C. 717/2). (108).

Lutetia (raised, introduced and sent by Messrs. Blom & Padding, Beverwijk, Holland). **A.M.** August 4, 1949.—4 feet tall; flower spike 16- or 18-flowered, 6 out at a time; flowers $5\frac{1}{2}$ inches diameter, Mandarin Red (H.C.C. 17), feathered crimson-purple at the throat. (106).

Vincent van Gogh (raised, introduced and sent by Messrs. M. van Waveren & Sons, Hillegom, Holland). **A.M.** July 18, 1949.—4 feet tall; flower spike 14- or 16-flowered, 7 or 7 out at a time; flowers $4\frac{1}{2}$ inches diameter, very evenly and well placed, a shade between Vermilion (H.C.C. 18/1) and Scarlet (H.C.C. 19/1) shaded Signal Red (H.C.C. 719/2), lower petals lined blue on cream. Early flowering. (116).

Va Banque (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **H.C.** August 4, 1949.—4 feet tall; flower spike 16-flowered, 6 or 8 out at a time; flowers 6 inches diameter, Dutch Vermilion (H.C.C. 717) on Signal Red (H.C.C. 719). (77).

The following variety has been deleted from the trials: **BONFIRE** (**H.C.** 1937) (67).

FLOWERS CHERRY-RED

Henri Dunant (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **A.M.** July 18, 1949.—4 feet tall; flower spike 20- to 22-flowered, 8 out at a time; flowers $4\frac{1}{2}$ inches diameter, evenly and well placed, Geranium Lake (H.C.C. 20/1) suffused with Orient Red (H.C.C. 819/1), lower petals Orient Red (H.C.C. 819/1) at throat. (79).

FLOWERS OF CRIMSON SHADES

Jo Wagenaar (raised, introduced and sent by Messrs. Konynenburg &

Mark, Ltd., Noordwyk, Holland). **F.C.C.** July 25, 1949.—Described R.H.S. JOURNAL, 74, p. 32 (**A.M.** 1948). (82).

The following variety has been deleted from the trials: CRIMSON GLOW (**A.M.** 1927) (76).

FLOWERS OF BLUE SHADES

Ravel (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **F.C.C.** July 25, 1949.—Described R.H.S. JOURNAL, 74, p. 32 (**A.M.** 1948). (88).

Libretto (raised, introduced and sent by Messrs. Konynenburg & Mark, Ltd., Noordwyk, Holland). **A.M.** July 18, 1949.—4 feet tall; flower spike 18-flowered, 5 out at a time; flowers $4\frac{1}{2}$ inches diameter, Sea Lavender Violet (H.C.C. 637/3), heavily flushed at margins with Violet (H.C.C. 636/1). Early flowering. (89).

FLOWERS PALE PURPLE

Paul Rubens (purchased by the Society). **H.C.** August 4, 1949.— $3\frac{1}{2}$ feet tall; flower spike 16-flowered, 7 or 8 out at a time; flowers $5\frac{1}{2}$ inches diameter, Rhodamine Purple (H.C.C. 29) on Cyclamen Purple (H.C.C. 30). (94).

The following variety has been deleted from the trials: GUY MANNERING (93).

FLOWERS RED-PURPLE

Aljechin (raised, introduced and sent by Messrs. Konyenburg & Mark, Ltd., Noordwyk, Holland). **A.M.** July 25, 1949.—Described R.H.S. JOURNAL, 74, p. 33 (**H.C.** 1948). (97).

SWEET PEAS TRIED AT GORING-BY-SEA, SUSSEX, 1949

The following varieties of Sweet Peas were recommended for Awards by the Joint Committee of the Royal Horticultural Society and the National Sweet Pea Society, after trial at The Normans Nurseries Ltd., The Wharni, Littlehampton Road, Goring-by-Sea, Sussex. (Fig. 18.)

Betty (raised, introduced and sent by Messrs. W. J. Unwin Ltd., Histon, Cambs.). **A.M.** June 24, 1949.—Plant vigorous; flower stems stiff, 17 inches long, four flowered; flowers $2\frac{1}{2}$ inches diameter, standards Geranium Lake (H.C.C. 20/1) flushed Scarlet (H.C.C. 19/1) on a cream ground; wings similar.

Crimson Excelsior (raised, introduced and sent by Messrs. Sutton & Sons Ltd., Reading). **A.M.** June 24, 1949.—Plant vigorous; flower stems 16 inches long, stiff, four flowered; flowers $2\frac{1}{2}$ inches diameter, standards Cardinal Red (H.C.C. 822/1) shaded Currant Red (H.C.C. 821/1); wings similar.

Golden Jubilee (raised, introduced and sent by Messrs. W. Atlee Burpee Co., Philadelphia, U.S.A.). **A.M.** June 24, 1949.—Plant vigorous; flower stems stiff, 15 inches long, four flowered; flowers $2\frac{1}{2}$ inches diameter, base colour Porcelain Rose (H.C.C. 620/1), heavily suffused with Geranium Lake (H.C.C. 20/1).

Highland Mist (raised, introduced and sent by Messrs. Carters Tested Seeds Ltd., Raynes Park, London, S.W. 20). **A.M.** June 24, 1949.—Plant vigorous; flower stems 15 inches long, four flowered; flowers $2\frac{1}{2}$ inches diameter, Mauvette (H.C.C. 537/2) flushed with Heliotrope (H.C.C. 636/2).

Peggy Edwards (raised, introduced and sent by Mr. H. P. Edwards, Old Hall Farm, Overton Bridge, Wrexham). **A.M.** June 24, 1949.—Plant vigorous; flower stems 17 inches, strong, flowers $2\frac{3}{4}$ inches diameter, four on a stem; standards Neyron Rose (H.C.C. between 623 and 623/1), ivory white

at extreme base; wings Neyron Rose (H.C.C. 623/1) at margins, paler towards the base.

Friendship (raised, introduced and sent by Messrs. W. Atlee Burpee Co., Philadelphia, U.S.A.). H.C. June 24, 1949.—Plant vigorous; flower stems 17 or 18 inches long; flowers $2\frac{1}{2}$ inches diameter; Carmine (H.C.C. between 21 and 21/1) flushed Geranium Lake (H.C.C. 20/1), wings somewhat paler.

Glow (raised, introduced and sent by Messrs. W. Atlee Burpee Co., Philadelphia, U.S.A.). H.C. June 24, 1949.—Plant vigorous; flower stems 16 inches long, four flowered; flowers $2\frac{1}{2}$ inches diameter, Neyron Rose (H.C.C. 623/1) flushed Phlox Pink (H.C.C. 625/1), wings paler, on a cream ground.

Lavender Bonnet (raised, introduced and sent by Messrs. Carters Tested Seeds Ltd., Raynes Park, London, S.W. 20). H.C. June 24, 1949.—Plant vigorous; flower stems 17 inches long, four flowered; flowers $2\frac{1}{2}$ inches diameter, Phlox Purple (H.C.C. 623/2) suffused Mallow Purple (H.C.C. 630/2).

Lime Light (raised, introduced and sent by Messrs. R. Bolton & Son, Birdbrook, Halstead, Essex). H.C. June 24, 1949.—Plant vigorous; flower stems 16 inches long, four flowered; flowers $2\frac{1}{2}$ inches diameter, standards Sea Lavender Violet (H.C.C. 637/2) flushed Mineral Violet (H.C.C. 635/2), wings somewhat paler.

Maid of Honour (raised, introduced and sent by Messrs. W. Atlee Burpee Co., Philadelphia, U.S.A.). H.C. June 24, 1949.—Plant vigorous; flower stems 14 inches long; flowers $2\frac{1}{2}$ inches diameter, standards Rhodamine Pink (H.C.C. 527) on an ivory ground, wings somewhat paler.

My Love (raised, introduced and sent by Messrs. Carters Tested Seeds Ltd., Raynes Park, London, S.W. 20). H.C. June 24, 1949.—Plant vigorous; flower stems 16 inches long; flowers $2\frac{1}{2}$ inches diameter, Phlox Purple (H.C.C. 632/2) with a Mallow Purple (H.C.C. 630/2) flush.

Shirley Pink (raised, introduced and sent by Messrs. Carters Tested Seeds Ltd., Raynes Park, London, S.W. 20). H.C. June 24, 1949.—Plant vigorous; flower stems 15 inches long; flowers $2\frac{1}{2}$ to $2\frac{3}{4}$ inches diameter, Porcelain Rose (H.C.C. 620/2) flushed with Neyron Rose (H.C.C. 621/1) and cream ground.

Stylish (raised, introduced and sent by Messrs. R. Bolton & Son, Birdbrook, Halstead, Essex). H.C. June 24, 1949.—Plant vigorous; flower stems 18 inches long; flowers $2\frac{1}{2}$ inches diameter; standards Mineral Violet (H.C.C. between 635 and 635/1) on a base of Sea Lavender Violet (H.C.C. 637/1), wings Veronica Violet (H.C.C. 639/1) suffused with Mineral Violet (H.C.C. 635/1).

Tips (raised, introduced and sent by Messrs. R. Bolton & Son, Birdbrook, Halstead, Essex). H.C. June 24, 1949.—Plant vigorous; flower stems strong, 16 inches long; flowers $2\frac{3}{4}$ inches diameter; standards white ground flushed pale rose, margins Rose Bengal (H.C.C. 25/2); wings white flushed pale rose, margins Rhodamine Pink (H.C.C. 527/2).

DWARF FRENCH BEANS AT WISLEY, 1949

Twenty-two varieties of Dwarf French Beans were received for trial at Wisley during 1949. All were sown in double rows on May 10, 1949, two feet separating each pair of rows. They were finally inspected by a sub-committee of the Fruit and Vegetable Committee on July 27, 1949, who made their recommendations for Awards as given below.

SEEDS SMALL, WHITE ROUND

The following varieties were grown: Nos. 3, 5 and 22x (John Innes), MERTON (Carters), DUTCH PRINCESS (Rood), as Haricot varieties.

SEEDS SMALL, WHITE, OVAL

The following variety was grown: No. 81 (Ferry-Morse) as a round podded stringless variety.

SEEDS SMALL, WHITE, CYLINDRICAL

The following variety was grown: RANGER (Associated Seed Growers) as a round-podded stringless variety, of semi-running habit.

SEEDS WHITE, MARKED BROWN AT HILUM

The following variety was grown: TENDERPOD (Burpee), a stringless variety.

SEEDS WHITE, BLACK AT EDGE AND HILUM

The following variety was grown: EARLY GIANT (Sutton), continuous cropping habit.

SEEDS CYLINDRICAL, LIGHT FAWN MOTTLED BLACK

The following varieties were grown: FLIGHT (Associated Seed Growers), pods round, stringless; TENDERGREEN (Ferry-Morse), pods round, stringless.

SEEDS CYLINDRICAL, BLACK

The following varieties were grown: BLACK WONDER (Clucas), DELIGHT (Harrison of Maidstone).

SEEDS LIGHT BROWN, SMALL

The following variety was grown for comparison: BOUNTEOUS.

SEEDS BROWN, CYLINDRICAL

The following varieties were grown: PEERLESS (Sutton), PREMIER (Sutton).

SEEDS PALE DUN

Masterpiece Improved (raised, introduced and sent by Messrs. Sutton & Sons, Ltd., Reading). **F.C.C.** July 27, 1949.—Plant vigorous, of compact, erect habit, with dark green vigorous foliage and a free heavy cropper. Pods borne well off the ground, six or seven in a cluster, pods straight, 7–9 inches long, $\frac{1}{2}$ inch wide, dark green, flat-oval; crop heavy. Ready July 20. A good even regular stock with much darker green foliage than other stocks of 'Masterpiece.'

The following variety was grown: MASTERPIECE (Nutting).

SEEDS SMALL, CYLINDRICAL, HALF WHITE, HALF BROWN

The Wonder (raised and introduced by Messrs. Watkins & Simpson, Ltd., and sent by Messrs. Nutting & Sons, Ltd., Merstham, Surrey). **H.C.** July 27, 1949.—Plant vigorous, of compact erect habit with dark green foliage. Pods 6–8 inches long, $\frac{1}{2}$ inch wide, dark green, flat oval, straight; crop heavy. Ready July 20. (**F.C.C.** 1929.)

SEEDS PALE DUN, MUCH MOTTLED REDDISH-BROWN

The Prince (raised and introduced by Messrs. Sutton & Sons, Ltd., and sent by Messrs. Harrison & Sons, Ltd., Maidstone, and Messrs. A. L. Tozer, Ltd., Pyports, Cobham, Surrey). **A.M.** July 27, 1949.—Plant vigorous, of erect habit, with dark green foliage. Pods 7–9 inches long, $\frac{1}{2}$ inch wide borne well off the ground, in clusters of seven to nine, dark green, flat oval, straight; crop heavy. Ready July 16. (**F.C.C.** 1936.)

Stocks of this variety were also sent by Messrs. Nutting & Sons, Ltd., and Messrs. Sutton & Sons, Ltd., but were less regular.

RUNNER BEANS AT WISLEY, 1949

Thirteen stocks of Runner Beans, representing varieties of the 'Prize-winner' and 'Streamline' types were received for trial at Wisley during 1949. These were sown in double rows on May 17, 1949. All made good growth and cropped freely in spite of the dry season. They were finally inspected

by a sub-committee of the Fruit and Vegetable Committee on September 12, 1949, who made their recommendations for Awards as given below.

SEEDS PURPLE WITH BLACK MARKINGS

Goliath (introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C. 2). **A.M.** September 12, 1949.—Plant vigorous, with large foliage. Pods 15 inches long, 1 inch wide, straight but with a tendency to curl and twist towards the point, medium green; crop heavy. A true and a regular stock.

Kingsbrook Monarch (raised, introduced and sent by Mr. A. T. Barnes, 13 Cardington Road, Bedford). **A.M.** September 12, 1949.—Plants vigorous with rather large foliage. Pods 16 inches long, 1 inch wide, straight but with a tendency to twist and curl towards the point, medium green; crop heavy. A true and an even stock.

Osmaston Giant (raised, introduced and sent by the Co-operative Wholesale Society, Ltd., Osmaston Park Road, Derby). **H.C.** September 12, 1949.—Plant vigorous, with large foliage. Pods 12 inches long, $\frac{3}{4}$ –1 inch broad, straight, dark green; crop heavy. A true, even stock. 'Streamline' type.

Streamline (introduced by Messrs. Carters Tested Seeds, Ltd., Raynes Park, London, S.W. 20, and sent by Messrs. Hurst & Son, Ltd., Houndsditch, London, E.C. 3). **H.C.** September 12, 1949.—Plant vigorous, with rather large foliage. Pods straight, 12 inches long, 1 inch broad, medium green; crop heavy. A true even stock.

The following varieties were grown in the trials: BEST OF ALL (Sutton), STREAMLINE (Nutting, Lucas, Ferry-Morse).

SEEDS PURPLE WITH FEW BLACK MARKINGS

Prizewinner (raised, introduced and sent by Messrs. Sutton & Sons, Ltd., Reading). **A.M.** September 12, 1949.—Plant vigorous, with large foliage. Pods straight, 12 inches long, 1 inch broad, medium green; crop heavy. A true and an even stock.

The following varieties were grown: COBHAM PARK (Tozer), PRIZEWINNER (Nutting, Rood, Ferry-Morse).

GARDEN BEET AT WISLEY, 1949

Forty-five stocks of Garden Beet were received at Wisley for trial in 1949. The round-rooted and intermediate kinds were sown on April 8, 1949, and the long-rooted varieties on May 10, 1949. All grew well in spite of the extremely dry conditions. The round and intermediate varieties were finally judged on July 20, 1949, the long varieties on October 12, 1949, by a sub-committee of the Fruit and Vegetable Committee, who made their recommendations for awards as given below. The number in brackets after the variety is that under which it was grown in the trial.

ROUND VARIETIES

Detroit Asco (raised and introduced by the Ferry-Morse Seed Co., and sent by Messrs. Chr. Olsen, Ltd., Odense, Denmark). **A.M.** July 20, 1949.—Foliage of medium size, greenish-bronze; roots globular, $2\frac{1}{2} \times 3\frac{1}{4}$ inches, uniform; flesh firm, dark blood-red, of good colour and quality. A true even stock. (7).

Detroit, Dark Red (raised, introduced and sent by the Ferry-Morse Seed Co., San Francisco, California, U.S.A.). **A.M.** July 20, 1949.—Foliage of medium size, greenish-bronze; roots globular, $2\frac{1}{2} \times 2\frac{3}{4}$ inches, uniform; flesh firm, dark blood-red, of good quality and colour. A true and a very regular stock. (10).

Empire Globe (raised by the Ferry-Morse Seed Co., introduced and sent by Messrs. J. L. Clucas, Ltd., Ormskirk, Lancs.). **A.M.** July 20, 1949.—Foliage rather large, greenish-bronze; roots globular, $2\frac{1}{2} \times 3$ inches; flesh firm, dark blood-red, of good quality; a true and even stock. (13).

Feltham Globe (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C. 2). **A.M.** July 20, 1949.—Foliage rather large, greenish-bronze; roots globular, $3 \times 3\frac{1}{4}$ inches; flesh firm, dark blood-red, of good colour and quality; a true and regular stock. (12).

Green Top Bunching (raised, introduced and sent by the Ferry-Morse Seed Co., San Francisco, California, U.S.A.). **A.M.** July 20, 1949.—Foliage rather large, greenish, which does not turn brown or red; roots globular, $2\frac{1}{4} \times 3\frac{1}{4}$ inches; flesh firm, dark blood-red. A true even stock. (18).

Good-for-All (raised, introduced and sent by the Ferry-Morse Seed Co., San Francisco, California, U.S.A.). **H.C.** July 20, 1949.—Foliage rather small and short, purplish-green; roots globular, $2\frac{1}{4} \times 2\frac{3}{4}$ inches, uniform; flesh firm, dark purplish-red, of good colour and quality. A true even stock. (5).

Summer Globe (sent by Messrs. Harrison (Maidstone), Ltd., Maidstone). **H.C.** July 20, 1949.—Foliage short, rather small, purplish-green; roots globular, $2\frac{1}{4} \times 2\frac{1}{2}$ inches, even; flesh firm, dark blood-red; of 'Detroit' type. (15).

The following varieties were grown in the trial: CRIMSON KING (Nutting) (19), CROSBY (Daehnfeldt) (2), CROSBY'S ASCO (Chr. Olsen) (1), DEEP BLOOD RED GLOBE (Hurst) (20), DETROIT (Daehnfeldt) (8), DETROIT SHORT TOP (Northrup King) (6), DETROIT DARK RED, FERRY'S STRAIN (Ferry-Morse) (19), contained 30 per cent. bolters, PERFECTED DETROIT (Northrup King) (11), contained 25 per cent. bolters, EARLY PERFECTION GLOBE (Speed) (14), EARLY WONDER (Northrup King) (4), irregular in shape and foliage, GRFEN TOP, EARLY WONDER (Ferry-Morse) (3), FIREBALL (Rood) (17), SUTTON'S GLOBE (Sutton) (16).

INTERMEDIATE VARIETIES

Obelisk (sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C. 3). **A.M.** July 20, 1949.—Foliage rather strong, deep purple; roots tankard-shaped, $3\frac{1}{2}$ inches long, 2 inches wide, uniform 25 per cent. out of soil; flesh firm, dark blood-red, of good quality and colour. A true and regular stock. (21).

Cobham Early (raised, introduced and sent by Messrs. A. L. Tozer, Ltd., Pyports, Church Street, Cobham, Surrey). **H.C.** July 20, 1949.—Foliage of medium size, light green, roots inclined to taper, 2 inches wide, 5 inches long, regular; flesh firm, brick red. A true even stock. This variety can be sown as early as the round varieties and matures as early. (23).

The following variety was grown in the trial: INTERMEDIATE or OBELISK (Sutton) (22).

LONG VARIETIES

Sutton's Greentop sent by Messrs. Sutton & Sons, Ltd., Reading). **A.M.** October 12, 1949.—Foliage stronger and greener than other stocks of 'Cheltenham Greentop'; roots tapering, 3 inches wide, 12 inches long, regular; flesh firm, dark blood red. (33).

Cheltenham Vigour No. 10 (raised, introduced and sent by Messrs. A. L. Tozer, Ltd., Pyports, Church Street, Cobham, Surrey). **H.C.** October 12, 1949.—Plant with rather large, vigorous foliage, pale green turning to bronzy-purple; roots tapering, 4 inches wide, 12 inches long, regular; flesh light brick red, paler than most stocks of this variety, with rather distinct zones. A true, even stock. This strain has stronger germination and more vigour than other strains of this variety. (31).

Non-Bleeding (sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C. 3). **H.C.** October 12, 1949.—Foliage of medium size,

green when young, changing to reddish-purple; roots tapering, 3 inches wide, 14 inches long, dark purplish-black; flesh firm, dark reddish-black. A true even stock. (44).

Sutton's Black (raised, introduced and sent by Messrs. Sutton & Sons, Ltd., Reading). **H.C.** October 12, 1949.—Foliage rather large, deep reddish-purple; roots tapering, 3 inches wide, 10 inches long, dark purplish-black; flesh firm, very dark reddish-black. A true, even stock. (41).

The following varieties were grown in the trial: **CHELTHENHAM GREEN TOP** (Hurst, Harrison (Maidstone), Yates, Harrison (Leicester), Nutting, Tozer, (24, 27, 26, 25, 28, 29), **CHELTHENHAM RESELECTED** (Watkins & Simpson) (30), **DOBBIE'S PURPLE** (Dobbie) (45), **BEST OF ALL** (Sharpe) (36), **DEVENTER BLACK LEAF** (Sluis) (40), **DUTCH MARKET** (Sluis) (34), **EXHIBITION BLACK** (Laing & Mather) (43), **LONG DUTCH, LIGHT-LEAVED** (van Beusekom) (35), **MARKET KING** (Rood) (32), **PRAGNELL'S EXHIBITION** (Hurst) (38), **RED SELECTED** (Nutting) (37), **REGAR EXHIBITION SELECTED** (Laing & Mather) (42), **SUTTON'S BLOOD RED** (Sutton) (39).

LATE CULINARY PEAS AT WISLEY, 1949

Twenty-four varieties of Late Culinary Peas—those maturing after the variety 'Onward'—were received at Wisley for trial in 1949. Half a pint of each was sown on March 25, 1949; all made good growth and cropped freely. The variety 'Onward' was grown as a control variety and the following varieties matured earlier: **LINCOLN DARK POD** (Hurst) (2); **SUPERGRADE HYBRID NO. 242, NO. 243** (Ferry-Morse) (21, 22), and are not further referred to. The trial was finally inspected by a sub-committee of the Fruit and Vegetable Committee on July 7, 1949, who made their recommendations for Awards as given below. The number in brackets following the variety is that under which the trial was grown.

2 TO 3 FEET : Seeds Wrinkled

Kelvedon Viking (raised, introduced and sent by Messrs. Hurst & Son Ltd., Staple Hall, Houndsditch, London, E.C. 3). **H.C.** July 7, 1949.—Haulm vigorous, 3 feet, medium green; pods single, blunt, straight, medium green, 4½ to 5 inches long; peas large, bright green, 6–8 in a pod; crop heavy. Ready July 12. (6).

The following varieties were included in the trials: **KELVEDON HURRICANE** (Hurst) (5), **LATER ONWARD NO. 2** (Hurst) (7), **PHENOMENON** (Sutton) (4), **RONDO** (Associated Seed Growers) (3).

3 TO 4½ FEET : Seeds Wrinkled

Ambition (raised, introduced and sent by Messrs. Sutton & Sons Ltd., Reading). **A.M.** July 7, 1949.—Haulm vigorous, heavy, medium green, 4 feet; pods single, 5 inches long, pointed, dark green, straight; peas 9 in a pod, large, bright green; crop heavy. Ready July 10. (18).

Evergreen (raised, introduced and sent by Messrs. Sutton & Sons Ltd., Reading). **A.M.** July 7, 1949.—Haulm 4½ feet, medium green; pods single, slightly curved forward, pointed, 4½ inches long, dark green and retain their colour; peas large, bright dark green, 10 in a pod; crop heavy. Ready July 6. (14).

Feltham Last Crop (raised, introduced and sent by Messrs. Watkins & Simpson Ltd., 27 Drury Lane, Covent Garden, London, W.C. 2). **A.M.** July 7, 1949.—Haulm 3½ feet, heavy, medium green; pods mostly in pairs, a few single, blunt, straight, medium green, 4½ inches long; peas large, bright green, 8 or 9 in a pod; crop heavy. Ready July 12. (10).

Aristocrat (raised, introduced and sent by Messrs. Nutting & Sons Ltd., Merstham, Surrey). **H.C.** July 7, 1949.—Haulm vigorous, 3½ feet, medium green; pods single and in pairs, pointed, straight, 4½ inches long; peas large, bright green, 6 to 8 in a pod; crop heavy. Ready July 10. (17).

The following varieties were included in the trials: GLADSTONE (Sutton) (11), INVICTA (Sutton) (12), LIBERTY (Sharpe) (13), LORD CHANCELLOR (Nutting) (9), MAJESTIC (Sutton) (8), PRIDE OF KENT (Harrison of Maidstone) (16).

OVER 4½ FEET : Seeds Wrinkled

Standard (raised and introduced by Messrs. Charles Sharpe & Co. and sent by Messrs. Nutting & Sons Ltd., Merstham, Surrey). **H.C.** July 7, 1949.—Haulm 5½ feet, strong, medium green; pods single, 6 inches long, pointed, medium green, slightly curved; peas 9 in a pod, large, medium bright green, sweet; crop heavy. Ready July 6. (20).

Strimar (raised, introduced and sent by Messrs. Ferry-Morse Seed Co., San Francisco, California, U.S.A.). **H.C.** July 7, 1949.—Haulm strong, 4½–5 feet, medium to dark green; pods single, pointed, 4½ inches, dark green and retain their colour, straight; peas large, 8 or 9 in a pod, bright green; crop heavy. Ready July 7, 1949. (23).

The following varieties were included in the trials: ADMIRAL BEATTY (Hurst) (19), DUKE OF ALBANY (Sutton) (25), EMERALD (Clucas) (15), ORMSKIRKIAN (Clucas) (24).

RIDGE CUCUMBERS AT WISLEY, 1949

Twenty-eight stocks of Ridge Cucumbers were received at Wisley for trial in 1949. They were sown in the open ground where they were intended to mature, on the flat, on May 19, 1949. In spite of the unfavourable season they grew and fruited well and were finally judged by a sub-Committee of the Fruit and Vegetable Committee on September 12, 1949, who made their recommendations for awards as given below. The number in brackets following the variety, is that under which it was grown in the trials.

The following proved to be not ridge varieties and are not further referred to: EVERGREEN (P. Rood) (11); SUCCESS (P. Rood) (26); TELEGRAPH HYBRID (Ferry-Morse) (27).

FRUITS LONG, CREAMY-YELLOW

The following variety was grown: AMSTERDAM FORCING (P. Rood), fruits pale cream (1).

FRUITS LONG, CYLINDRICAL, GREEN

Perfection (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C. 2; also sent by Messrs. S. E. Marshall & Co., Wisbech, Cambs., and Messrs. A. L. Tozer, Ltd., Pyports, Church Street, Cobham, Surrey, who share the award). **A.M.** September 12, 1949.—Plants of vigorous growth, with dark green healthy foliage. Fruits 12–15 inches long, 2½–2¾ inches diameter, dark green symmetrical, very slightly ridged, little or no neck; flesh thick. Crop heavy. All were good even stocks of this variety. (12, 23, 13).

King of Ridge (raised, introduced and sent by Messrs. Sutton & Sons, Ltd., Reading). **H.C.** September 12, 1949.—Plant vigorous, with dark green, healthy foliage. Fruits 11–13 inches long, 2½–2¾ inches diameter, dark green, symmetrical, very slightly ridged, with a short neck; flesh thick. Crop heavy. A true, even stock. (16).

Withers Ten Week Ridge (raised by Mr. E. W. Withers, introduced and sent by Messrs. J. L. Clucas, Ltd., Ormskirk, Lancs.). **H.C.** September 12, 1949.—Plant vigorous, with dark green, healthy foliage; fruits 10–12 inches long, symmetrical, 2½–2¾ inches diameter, dark green; flesh thick. Crop heavy and continuous. A good even stock. (5).

The following varieties were grown: CHAMPION RIDGE (Harrison (Maidstone)) (2), CHELTENHAM (Watkins & Simpson) (14), DANISH KING (Chr. Olsen), spines white, fruits dark green with paler ribs (3), EVERGREEN (Sluis) (6), EARLY FORTUNE (Northrup King) (4), GIANT DELICACY (Vatter) (10), GREENLINE (Carters), retains its colour (7),

HEURIEDLER (Vatter) (8), HYBRID (Burpee) (9), KING OF RIDGE (Watkins & Simpson) (15), LANGE LANDS GIANT IMPROVED (Chr. Olsen), retains its colour well (19), LONDON RIDGE (Nutting) (17), LONG GREEN (Sutton, Northrup King) (20, 18), MARKETER (Northrup King), retains its colour well (21), NUKU (Harrison (Leicester)) (22), SPINELESS (Stonor) retains its colour well (25), PROLIFIC (Sutton) (24), TORPEDO (Vatter), fruits curled and twisted, snakelike (28).

RHUBARB AT WISLEY, 1949

The following Awards to Rhubarb have been made by the Council of the Royal Horticultural Society on the recommendation of a sub-Committee of the Fruit and Vegetable Committee, after trial at Wisley. The report follows the classification given in the report of the Trial in 1929, JOURNAL, 56, pp. 136-139.

STALKS AT MATURITY MOSTLY RED

LEAF MORE OR LESS DOWNY

Flesh Green

Macdonald (raised by the Horticultural Department, Macdonald College, Canada, introduced and sent by the late Mr. George Appleton, also sent by Messrs. John McGeorge, Ltd., 176 Bruntsfield Place, Edinburgh). A.M. May 18, 1949, as a variety for general use.—Stalks 28 inches long, 1½ inch diameter when fully grown, concave on upper and shallowly ribbed on under surface; very deep red, becoming slightly paler at the blade bud and on the midribs; flesh in young sticks pale pink, very pale green in older. Leaves large, broad heart-shaped, dark green, upper and under surfaces covered with downy hairs. Few flower stems. Fit for use, when 6 inches long, April 8.

Timperley Early (raised by the late Mr. H. Marsland, introduced by Mr. T. Baldwin and sent by the Cheshire School of Agriculture, Reaseheath, Nantwich, Cheshire). H.C. May 18, 1949, as an early maturing variety. Stalks 22 inches long, 1 inch diameter, when fully grown, flat on upper and faintly ribbed on under surface, edges rounded; at base bright red passing to light green, much speckled with dull red at leaf. No flower stems produced. Fit for use, when 6 inches long, March 12. A bud sport from 'Linnaeus.'

Valentine (sent by Messrs. John McGeorge, Ltd., 176 Bruntsfield Place, Edinburgh). H.C. May 18, 1949, as a variety for general use.—Stalks 26 inches long, 1¼ inch wide, when fully grown, slightly concave on upper and slightly ribbed on under surface, bright fiery-red from the base to well into the midrib of the leaf. Leaves rounded heart-shaped, dark green, upper and under surfaces covered with downy hairs. Few flower stems. Fit for use, when 6 inches long, April 7. Very similar to 'Macdonald' in habit and colour of the stalk.

LEAF GLABROUS

Flesh Green

Hawke's Champagne (raised and introduced by the late Mr. Hawke, selected and sent by Messrs. F. A. Secrett, Ltd., Bell Farm, Felcott Road, Walton-on-Thames, Surrey). F.C.C. May 18, 1949, as a variety for general use.—Stalks 22 inches long, 1½ inch wide, when fully grown, bright red at base, shading to dark green at leaf, flat on upper and smooth on under surface; flesh bright green, little fibre. Leaves pointed, heart-shaped, dark green, smooth. No flower stems produced. Fit for use, when 6 inches long, March 28. A very vigorous, non-flowering stock of this variety. (A.M. 1929).

Early Superb (raised, introduced and sent by Mr. H. M. Reed, Greenways, Lockshill, Portslade, Sussex). H.C. May 18, 1949, as an early maturing variety.—Stalks 18 inches long, 1½ inch wide, when fully grown, concave on upper, broadly ribbed on under surface, dull bronzy-red at base shading to

pale red at middle and passing to pale green with margins speckled red towards the leaf; flesh pale green; leaf pointed heart-shaped, dark glossy green. No flower stems produced. Fit for use, when 6 inches long, April 2.

STALKS AT MATURITY MOSTLY GREEN

LEAF MORE OR LESS DOWNY

Flesh Green

Giant Crimson Grooveless (raised, introduced and sent by Mr. T. Hancock, 38 Leeming Street, Mansfield, Notts.). **A.M.** May 18, 1949, as a variety for private garden use. Stalks 24 inches long, $1\frac{1}{2}$ inch wide, almost flat and faintly ribbed on upper, distinctly ribbed on under surface; when young, rich crimson changing to green, except towards the base, where it is dull carmine; flesh green. Leaves large, pointed heart-shaped, dark green, crinkled, margins wavy, rather downy beneath. No flower stems produced. Fit for use, when 6 inches long, April 8.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1949

SHRUBS

Abutilon megapotamicum **A.M.** September 6, 1949. A plant of rather striking appearance, it is grown to the best advantage against a warm wall. The leaves are triangular-cordate, up to 3 inches long, irregularly crenate and of velvety texture. The long-pedicelled drooping flowers have an inflated, five-ribbed calyx of Blood Red (H.C.C. 820/3) and petals of Mimosa Yellow (H.C.C. 602), while the long exserted stamens are dark crimson. Exhibited by Sir Henry Price, Wakehurst Place, Ardingly, Sussex.

Campsis grandiflora **A.M.** September 6, 1949. This beautiful climber has been known under a diversity of names, the best known being, perhaps, *Tecoma chinensis*. The leaves are pinnate with seven to nine ovate-lanceolate glabrous leaflets. The flowers are borne in terminal panicles of about twenty flowers, which are 3 inches long and 3 inches wide. The outside of the corolla is Marigold Orange (H.C.C. 11/2), while the inner surface of the corolla lobes is Mandarin Red (H.C.C. 17/1), the inside of the deep yellow tubes also being veined with this shade. Exhibited by the Director, R.H.S. Gardens, Wisley.

Euonymus europaeus 'Red Cascade' **A.M.** November 1, 1949. This very ornamental variety of the European Spindle-tree is the best of a large number of seedlings raised by the exhibitors. It forms a tall bush of graceful, arching habit, and has fruited profusely and regularly over a number of years. The ripe fruit is about $\frac{3}{4}$ inch across, with four rounded, Rose Opal (H.C.C. 022) lobes which open to reveal large orange (710) seeds. Exhibited by Messrs. George Jackman & Son (Woking Nurseries) Ltd., Woking, Surrey.

Evodia hupehensis **A.M.** September 6, 1949. This handsome tree is covered with red fruits, Chrysanthemum Crimson (H.C.C. 824/1), which follow insignificant whitish flowers. The shiny green leaves are pinnate, having five to seven leaflets. Exhibited by Colonel F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Highdown, Goring-by-Sea, Sussex.

Fascicularia bicolor A.M. September 6, 1949. This Chilean plant is not very frequently seen in cultivation as it needs protection against frost. The rigid linear leaves are $1-1\frac{1}{2}$ feet long and form a dense rosette, in the centre of which the flower-heads appear, the individual flowers of which are greeny-blue. The leaves bear curved prickles on the margins and are unusually variegated, the lower 6 inches being bright vermilion while the remainder of the leaf is dull green. Exhibited by Sir Henry Price, Wakehurst Place, Ardingly, Sussex.

Malus 'Golden Hornet' A.M. October 18, 1949. A very attractive yellow-fruited Crab, raised as a seedling from *Malus* \times *Zumi* var. *calocarpa*. The Saffron Yellow (H.C.C. 7/2) fruits, which are carried in clusters of about four, vary a little in shape from globose to ovoid, and are about $\frac{3}{4}$ inch long. Exhibited by Messrs. J. Waterer Sons & Crisp, Ltd., Bagshot, Surrey.

Pinus Montezumae, glaucous form A.M. October 4, 1949. A very handsome and distinct Mexican Pine introduced by Hartweg in 1839. The glaucous form to which the award is given is generally considered hardier than the type. The grey-green leaves, over 9 inches in length, are arranged in long-sheathed clusters of five and spread radially from the stem. The specimen shown bore two decurved, narrow, slate-grey cones about $4\frac{1}{2}$ inches long. Exhibited by G. H. Dowty, Esq., Grayswood Hill, Haslemere. (Fig. 9.)

Rosa rubrifolia A.M. September 20, 1949. A delightful European Rose species with erect purplish, bloomy stems and bluish-green, purple-tinged leaves made up of seven to nine elliptic leaflets, 1 to 2 inches long. The red flowers are about $1\frac{1}{2}$ inches across, and are followed by egg-shaped hips, at first coloured like the foliage but later changing to Orient Red (H.C.C. 819). Some very fine sprays were exhibited, the largest carrying no fewer than 45 hips in a large terminal cluster. Exhibited by A. T. Johnson, Esq., Bulkeley Mill, Tyn-y-Groes, Conway, N. Wales.

BULBS

Galanthus nivalis subsp. Olgae A.M. October 18, 1949. This Snowdrop, from Mt. Taygetus, in Greece, has the unusual habit of flowering in the open garden in October, the leaves developing later. In size and form the flowers resemble those of the common Snowdrop but the ovary and the heart-shaped green blotch on the outside of the inner perianth segments are somewhat paler in colour. Exhibited by Col. F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Highdown, Goring-by-Sea, Sussex.

Nerine filifolia A.M. October 18, 1949. A very dainty half-hardy bulbous plant, very suitable for pot culture in the cool greenhouse. The bulb produces several terete, grassy leaves about 10 inches long, and slender, erect scapes 16 inches high bearing from four to six flowers. The linear perianth-segments are $1\frac{1}{2}$ inch long, recurved and crimped at the tips, of light Solferino Purple (H.C.C. 26/3). Exhibited by Col. R. S. Clarke, M.P., Borde Hill, Haywards Heath, Sussex.

Worsleya procera A.M. October 4, 1949. A very uncommon Brazilian Amaryllid closely allied to *Hippeastrum*, but differing from

the species of that genus in its seed structure and flower colour. The plant produces a dozen or more leathery, falcate leaves over a yard long, their bases forming a sub-erect false stem about 3 feet high. This is slightly exceeded by the flattened peduncle, which carries about six flowers subtended by two long green spathes. The perianth is trumpet-shaped, 6 inches long, with six oblanceolate, undulate segments with spreading tips. Their upper part is bright Heliotrope (H.C.C. 636/1), becoming spotted with the same colour in the middle portion inside and passing to white at the base. The colour extends to the base on the outside of the segments. Exhibited by Major A. Pam, O.B.E., M.A., F.L.S., V.M.H., Wormley Bury, Broxbourne, Herts. (Fig. 17.)

ORCHIDS

Brassolaeliocattleya 'Madinette' A.M. October 18, 1949. Flower large in size and thick in texture. Sepals and petals bronzed-red, the expansive labellum reddish crimson. Raised and exhibited by Messrs. Charlesworth & Co., Haywards Heath. The parents were *Blc.* 'Zante' and *Lc.* 'Mrs. Medo.'

Cattleya 'Bow Bells' var. 'Snowdrop' A.M. October 18, 1949. One of the best forms of this beautiful pure-white Cattleya. Obtained by crossing *C. Edithae* with *C.* 'Suzanne Hye.' Exhibited by Mr. Clint McDade, Signal Mountain, Tennessee, U.S.A.

Cypripedium 'Crimea' A.M. November 1, 1949. This handsome and well-formed flower has a dorsal sepal that is mainly crimson-purple, while the petals and labellum are brownish with mahogany-red shading. The result of crossing *C.* 'Balaclava' with *C.* 'Redstart.' Exhibited by Messrs. Sanders, St. Albans.

Laeliocattleya 'Resolute' var. 'Dauntless' A.M. October 18, 1949. This robust plant bore a spike of four unusually large flowers of light rosy-mauve colour, the labellum ruby-purple and with an undulating margin. The result of crossing *Lc.* 'Aphrodite' with *Lc.* 'Mrs. Willoughby Pemberton.' Raised and exhibited by H. W. B. Schroder, Esq., Dell Park, Englefield Green, Surrey.

BOOK NOTES

"The Dianthus: A Flower Monograph." By Will Ingwersen. 8vo. 128 pp. Illus. (Collins, London, 1949.) 10s. 6d.

The term "monograph" is normally taken to imply a detailed botanical survey of a genus, so that the sub-title may mislead people into thinking that "The Dianthus" by Will Ingwersen gives a full account of this genus, especially those people who are familiar with the excellent pamphlets on certain alpine plants that are being produced by the author and his father. Unfortunately this is not the case; but once one has disabused one's mind from the idea of a new botanical survey of the genus *Dianthus* and discovered that one is being offered a simple guide from the gardener's point of view, the book comes into a different category and can be appreciated at its proper value.

The author knows the plants, has collected many of them and is familiar with their cultural requirements; this knowledge he is able to pass on to others. He is not concerned with Carnations, whether greenhouse or border varieties, but only with the species and the smaller hybrids, in fact, such kinds as may suitably be used in a rock

garden. There is an interesting chapter on the Distribution of the genus, others on Cultivation, Propagation, Hybridizing, Exhibiting, and then two on the plants themselves. A fair number of the *Dianthus* species are discussed, at first in alphabetical order which is departed from later; the treatment is discursive rather than detailed but gives quite a good general idea of the plants available for cultivation. The chapter on Garden Hybrids is also of considerable interest.

The black and white illustrations are very good (but try turning Fig. 13 round). The colour plates are not, on the whole, quite so satisfactory though one feels the originals may have been better than the reproductions.

VERA HIGGINS

“Garden Weeds and their Control.” By S. B. Whitehead, D.Sc. 155 pp., 10 figs. Small 8vo. (Dent.) 7s. 6d.

Dr. Whitehead has written a short, simple, but accurate little book to help gardeners to master their weeds. Pride of place is given in the order of the text to weed control by means of cultivation, but the high cost of manual labour is pointed out, when compared with the use of mechanical and chemical methods. These methods are then reviewed and a brief mention is made also of the biological methods of control. The discussion of suitable chemicals is adequate, but the author considers D.N.O.C. “relatively harmless and non-corrosive”, it certainly is “more congenial to use than sulphuric acid”, but it would have been well at this point to warn readers of the very real dangers arising from the use of D.N.O.C. for several fatalities have already resulted among workers spraying cereals; protective clothing is recommended. With D.N.O.C. the seasonal temperature plays a most important part in regard to human toxicity, so that it is more dangerous in summer. Selective weed killers of the hormone kind are briefly considered; and weeds in lawns, in borders, and water weeds are dealt with concisely.

The diagrams of weeds will prove helpful, the botanical names useful—and they are free from error—and useful references are given to original articles and other sources of information. The index, however, contains several errors.

M. A. H. TINCKER

“The Fig.” By Ira J. Condit. 222 pp. (Waltham, Mass.: The Chronica Botanica Co.; London, W.C.2: Wm. Dawson & Sons, Ltd.) \$5.

It is pleasing to welcome a book in English devoted entirely to the Fig, for this ancient fruit is a favourite with many. Even in temperate climates, with a modicum of protection from glass or a wall, the Fig will fruit satisfactorily. This does not apply with many subtropical fruits. The two existing books on the Fig were both published about forty years ago, one being in Spanish and the other in Italian. The author is a well-known authority on the Fig in the United States, having devoted a life-time to its study. His new work is not intended simply as a manual for the practical Fig cultivator. There is much of interest and value in its pages, with chapters on the history and general botany of the Fig, varieties, fruit characters, caprification, propagation and cultivation, utilization, pests and diseases.

F. N. HOWLS

“Introgressive Hybridization.” By Edgar Anderson. ix + 109 pp. Illus. (John Wiley & Sons, Inc., New York; Chapman & Hall Ltd., London). 1949. 18s. net.

This very interesting book is based upon a wide experience of hybrid populations in the field and breeding ground. By “introgressive hybridization” is meant the gradual infiltration of the germplasm of one species into that of another by repeated back-crossing of the hybrids to one or both parents—one species introgresses into another. A detailed account is given of introgressive hybridization in *Iris fulva* and *I. hexagona* var. *giganti-caerulea* in the Mississippi Delta. The influence of the habitat generally restricts hybridization very strongly and hybrid swarms tend to be limited to times and places where nature or, more often, man has “hybridized the habitat.” The genetic basis of introgression is now explicable by the usual theories of cytogenetics—genes and their segregation, linkage, crossing over etc. The limitation of recombinations by linkage is emphasized but it is suggested that it is more effective to think of linkage as a factor of racial and specific cohesion rather than as a barrier between species and between races. The author has much that is wise to say regarding the composition and distinctions between species. It is particularly gratifying that he does not regard sterility as the one and only criterion of specific distinction. There are many different kinds of barriers between species; some are internal, some are external. Linkage may

provide the necessary initial isolation that allows other internal isolating mechanisms to accumulate under the action of natural selection. Introgressive hybridization has also been of very great importance in the evolution of cultivated plants and weeds. Man, by removing external barriers between species, allows these to cross increasingly and also provides "hybridized habitats." The methods of studying introgression are dealt with under the following headings: scatter diagrams, pictorialized scatter diagrams, ideographs, radiate indicators, hybrid indices, standardized photographs, and extrapolated correlates. Parts of this book make easy reading but some of the theoretical portions require considerable concentration to follow.

W. B. TURRILL

"The Care and Repair of Ornamental Trees." By A. D. C. Le Sueur, B.Sc., F.R.I.C.S. Ed. 2. 224 pp. Illus. 8vo. (Country Life, 1949.) 18s.

Those who have the care and repair of trees and who have had access to the first edition of Mr. Le Sueur's book, published in 1934, will have had a sure guide and will welcome this second edition, which repeats and adds to the clear and dependable advice given in the first. Practically all the problems that arise in the care and preservation of trees are squarely met and fully dealt with and we have no hesitation in commending it to all tree-lovers for both its text and its illustrations. A chapter on the safety of men working on trees is among the new ones and is a particularly valuable one, for one often finds that familiarity with the risks leads to contempt of them which is certainly unwise.

"Blomster Dyrking Under Glass." By Prof. Arne Thorsrud. 378 pp. Illus. 8vo. (Grondahl & Sons, Oslo.) 1949.

An excellent account in Norwegian of the cultivation under glass of flowering plants for market as practised in Norway. It is written by the head of the State Horticultural School. It is in three sections, dealing with pot-plants, flowers for cutting, and the forcing of hardy plants respectively and includes almost all the plants which find their way to the florists' shops in Britain. The directions for cultivation are clear and the book is well illustrated by pictures of growing plants and of methods. The photographs show that the methods adopted largely overcome the great difference in length and intensity of sunlight compared with our own in England. Most of the varieties grown are well known here and are apparently all of alien (*i.e.* not Norwegian) origin. A short list of books dealing with the principal plants concludes the book.

"The Tuberous Begonia its Development and Culture." By Allan G. Langdon. 92 pp. Illus. (Published by the author, Mendip Press Ltd., Bath.) 12s. 6d. net.

As Lord Aberconway remarks in his foreword to this book, few plants have shown such striking improvement as tuberous Begonia hybrids.

After the basic crosses of the original Andean species were introduced by the House of Veitch, and other early hybridists had produced doubles of poor shape and habit, the author's father, C. F. Langdon, V.M.H., commenced work on them. A few years later he joined forces with another keen grower, J. B. Blackmore, founding the firm of Blackmore & Langdon, of Bath, in 1901. The evolution of these Begonias is a particularly British achievement, for with all due recognition to other workers, their development has been largely due to C. F. Langdon, his sons, Allan and Stephen, and their keen staff.

As Charles Langdon started breeding Begonias with the Jubilee series, and the firm will soon enter its Jubilee year, the issue of this monograph is timely. It should prove very useful to the keen amateur grower, is clearly and soundly written, well printed, and carries 28 interesting illustrations.

After the brief history, excellent chapters on propagation by seed and cuttings follow. All aspects of cultivation, both in pots and for bedding are covered, including feeding, disbudding, exhibiting, ripening and storage, and composts and pests and diseases are adequately dealt with.

A valuable addition to horticultural literature on the subject.

F. J. BEDSON

"Die Baumschule." (The Tree and Shrub Nursery). By Gerd Krüssmann. Cr. 8vo. 440 pp. With over 300 drawings and numerous tables. (Paul Parey, 1949). Price DM 26 (linen), DM 25 (cardboard).

Although the author describes this book as a sequel to his *Praxis der Gehölzvermehrung*, tree and shrub propagation is here again very fully dealt with. The object of this repetition is apparently to make available for the German nurseryman a work of

reference within the compass of a single volume. In the preface, Herr Krüssmann writes that the book will be a trusted assistant to the nurseryman, not only at his office desk, but also in the course of his work outside. That this statement is not an exaggeration will be accepted by those who have met Herr Krüssmann and know of his extensive knowledge of plants and his enthusiasm; that it fittingly describes the book will be apparent to those who read it. It is obvious that Herr Krüssmann has himself carried out the work that he discusses, and that he has also handled the plants about which he writes so authoritatively. When he has had no actual experience in handling a particular plant, this is mentioned; when the information has not been obtained at first hand, the source is given. Since the section that deals with tree and shrub propagation is more authoritative than any work that has yet appeared in this country, one naturally considers if it should be translated into English. For various reasons, however, this is hardly advisable. The book has been written for the severer winter climate of Central Europe, and consequently the cultural methods differ from ours. Moreover, what British horticulture—and indeed horticulture in general—seriously lacks at present is a reliable work on plant propagation as a whole and not only on the propagation of woody plants; and a work in which the principles as well as the practice of propagation are discussed.

There are some unfortunate slips in the present book. For instance, *Populus trichocarpa* is included in a list of Poplars that are not readily propagated by cuttings. There are also many typographical errors in the plant names as well as a few in the German text, and it is to be hoped that in a second edition the standard of proof reading will be commensurate with the standard of information provided in the book. One should like to see the present volume produced as faultlessly as a similar but pre-war work by the same publishers, namely Kache's *Praxis des Baumschulbetriebs*.

E. E. KEMP

“Better Glasshouse Crops.” By W. J. C. Lawrence. Cr. 8vo. 57 pp. Illus. (Allen and Unwin.) 5s.

Mr. Lawrence is head of the Garden Department at the John Innes Horticultural Institution and for some years has been conducting a number of controlled experiments to establish the best method of treating some of the more important glasshouse crops. The main results of his work were published in *Science and the Glasshouse*. This little book covers much of the same ground and consists of a series of short chapters which first appeared in *The Grower*. This work is of great importance to all growers, both commercial and amateur, of glasshouse crops such as Tomatoes and Lettuces, and none of them can well afford to ignore it. This little book is clearly presented and many will be grateful for the clear directions and concrete conclusions supported by experimental evidence.

P. M. SYNGE

“The Skeptical Gardener.” By Humphrey Denham. Demy 8vo. 224 pp. Illus. (Harrap.) 10s. 6d.

Keen gardeners will welcome this new edition in Messrs. Harrap's Country-lovers library of Colonel Denham's fascinating book of gardening essays. These were first published in 1940 under the name Humphrey John. They range widely over such a variety of subjects as “The Virtues of a North Wall,” “The Labour-saving Garden” (mostly about Roses), to “The Mowing Unit” of a flock of Chinese geese. All are personal and all are stimulating. The wood-cut illustrations by Astrid Walford are also attractive.

“Botany for Gardeners.” By R. P. Faulkner, with a foreword by Sir Frederick Keeble, C.B.E., F.R.S. Demy 8vo. 236 pp. Illus. (Frederick Muller.) 12s. 6d.

This is one of the best books which I have read on this subject and it is certainly no easy one to undertake. Mr. Faulkner is clear and concise and his short chapters are interesting and easy to read yet he does not seem to have compromised the validity of his work by over-vague generalizations or by the glossing over of complicated matters in order to make them more easily understood. Sir Frederick Keeble writes in his foreword “It is because the author has chosen the hard road, and not the easy one that leads nowhere that I have such pleasure in commending his book to my fellow craftsmen.” This is high praise from such an authority and the book should be helpful to many gardeners who would like to know the outlines of the physiology, cytology, genetics and nomenclature of the plants they grow.

P. M. SYNGE

"Practical Lawncraft." By R. B. Dawson. Demy 8vo. 315 pp. Illus. (Crosby, Lockwood.) 15s.

This is a new and revised edition of Mr. Dawson's book which was first published in 1949. The author is Director of the St. Ives Research Station of the Board of Green-keeping Research and, as might be expected, this book is a most comprehensive and authoritative account of all aspects of lawn making and tending. After general sections on construction of new lawns, weed eradication and renovation of neglected lawns, there are special chapters dealing with the most suitable grasses for particular games and the upkeep of the respective grounds; even aerodromes are included. A new appendix has been added on "Selective Weedkillers" which have so radically lessened in the last few years the burden of keeping grass clear of weeds.

"Manures and Fertilizers and their Horticultural application." By R. P. Faulkner. Cr. 8vo. 112 pp. (Pitman.) 7s. 6d.

This book is based on a series of articles contributed to the *Gardeners' Chronicle* and should prove helpful to many growers. After two general chapters on the aspects of soil fertility, Mr. Faulkner deals with the inorganic fertilizers, the trace elements and then with the organic manures and composts. Final chapters deal with crop rotation and the fertilizers required by particular groups of vegetables, glasshouse and cloche crops and fruit. This book is clearly and simply written and can be generally recommended.

"Les Rosiers dans nos Jardins." By Henry Fuchs. 220 pp. Illus. (La Maison Rustique, 26 Rue Jacobo, Paris VIe.)

This little book contains a series of really fine coloured plates of modern French Roses taken by M. Meilland, the breeder of so many fine varieties, together with recommendations of the most suitable Roses for various situations. It is interesting to compare this with an up-to-date English list. There is also a chapter on the evolution of the modern Rose.

"Good Salads and Salad Dressings." By Ambrose Heath. Cr. 8vo. 106 pp. (Faber and Faber.) 6s.

A useful little book which should bring variety and spice to a dish which is too often neglected in English homes. Here are dressings and exotic salads to delight the most cosmopolitan epicure and an almost infinite variety of recipes, the majority of which are well within the means of the average small house and garden.

"The Quarter Acre Garden." By George E. Whitehead. 124 pp. Illus. (Pilot Press, London.) 6s. 6d.

This is a remarkable little book. Mr. Whitehead has attempted the impossible in trying to cover in 115 pages the making and managing of even a $\frac{1}{4}$ acre garden, but, by providing astonishingly compendious notes on almost every conceivable aspect of garden construction and maintenance, has come surprisingly near to achieving it. The book is, of course, for the veriest beginners and if it cannot guide them all the way certainly sets them off in the right direction.

Appropriate garden features are suggested in a selection of good photographs.

"My Garden's Scrapbook of Wit and Wisdom." Compiled by Theo. A. Stephens. Cr. 8vo. 96 pp. (My Garden, 34 Southampton St., W.C.2.) 5s.

Here are a series of short quotations, some philosophical, some practical, many entertaining, selected from those which have appeared in *My Garden* during the past fifteen years. Mr. Stephens writes that one of the greatest of his editorial pleasures has been the selection and publication of these fragments of wit and wisdom, which have given him satisfaction and sometimes comfort. A delightful bedside book, this little work should also give pleasure to many Fellows of the Society.

"The Scented Garden." By Eleanour Sinclair Rohde. Cr. 8vo. 318 pp. Illus. (The Medici Society.) 12s. 6d.

This is a new edition, revised and enlarged, of Miss Rohde's delightful book which first appeared in 1931. A new chapter on the making of a small scented garden with a plan has been added while the Plant Lists have also been enlarged. Particularly interesting I have always found the chapter on "The Scented Garden in mid-winter."

"Gall Midges of Economic Importance." Vol. IV. *Ornamental Plants and Shrubs*. By H. F. Barnes. 8vo. Illus. 166 pp. (Crosby Lockwood.) 15s.

This volume, together with the last volume dealing with Gall Midges of Economic Importance to Fruits, are of special importance and interest to Horticulturists. Dr. H. F. Barnes is now the recognized authority on the group. The most important of these insects to growers in England are probably the Chrysanthemum and Violet Gall Midges but Gall Midges from many parts of the world are discussed. Mr. G. Fox Wilson, the Entomologist to the Society, has written a foreword to the volume in which he says, "While many applied entomologists are and have been interested in taxonomy, there are few who are gifted with a combination of the highly critical mind of the systematist with the perspicacity of the applied worker. In this and other volumes of the work one observes the almost unique combination of both, and notes the meticulous care that has been taken in the preparation of this monograph, which should prove a source of inspiration to other biologists who will wish to emulate the work of the author." No further comment is required except to add that there is a very full list of references and index.

"Handbooks for the Identification of British Insects." Vol. 1, Part 5. *Dermaptera and Orthoptera*. By W. D. Hincks. 20 pp., 74 figs. 3s. 6d. net. Vol. 1, Part 10. *Odonata*. By F. C. Fraser. 48 pp., 24 figs. 7s. 6d. net. Vol. 9, Part 1. *Diptera*. i. Introduction and Key to Families. By H. Oldroyd. 49 pp., 97 figs. 7s. 6d. net. (Royal Entomological Society of London, 1949).

The Council of the Royal Entomological Society deserve high praise for their foresight in presenting a series of handbooks designed to aid the keen amateur and collector of insects to identify his captures. The well-known series, entitled, "Faune de France" provided the student hitherto with authoritative keys to the French Insect Fauna, and these excellent treatises have been emulated by the British authorities.

It is proposed to cover the field in a series of ten volumes, of which three parts have now appeared, each written by a specialist or group of specialists. The parts are clearly written, and certain new and original matter is included though the groundwork is based upon existing published keys. The numerous line drawings reach a high standard, and aid considerably in the determination of species. No doubt exists that both the intelligent amateur and the professional entomologist will consider these textbooks as being entirely indispensable.

G. FOX WILSON

"Harnessing the Earthworm." By T. J. Barrett. 166 pp., 7 plates, 13 figs (Faber & Faber, Ltd., 1949). 12s. 6d. net.

The enthusiasm of the author in recommending the extensive breeding of earthworms to maintain and build up natural sources of humus so essential to plant nutrition recalls Charles Darwin's classic study "The Formation of Vegetable Mould through the action of Earthworms," originally published in 1837. Attention is again being directed to the value of earthworms to agriculture, and the improvement brought about by these animals in the physical condition of the soil.

Among those who have investigated the activities and benefits of earthworms, that of the author must be placed high on the list; though others, including Sir John Russell and A. C. Evans of Rothamsted, Sir Edward Salisbury, and several Continental workers have published data which are incorporated in the work under review.

Dr. Barrett states that in the chain of life, the weakest link in nature has been the slow transition of vegetable and animal life back to the soil for use again in the eternal cycle. The author has devised methods whereby earthworms may be bred under domestic methods thus outlining the basic principles of earthworm farming. One serious omission is that no mention is made of the natural enemies of these Annelids, nor of the biological factors affecting worm populations.

The approach to such an important subject should be sane and objective in outlook, and no amount of woeful forebodings will avail. It may well be that new factual evidence is being accumulated as to the invaluable work of these creatures in maintaining soil nutrition, and the unbiased evidence of soil scientists will be obtained only after experimental data have been assessed under varying conditions of climate and soil patterns.

This book deserves the serious attention of both scientific and practical agriculturists, and may be read profitably by all whose interest lies in the production of crops and in the improved condition of the soil as a medium for plant health.

G. FOX WILSON

"The Dragonflies of the British Isles." By Cynthia Longfield. 256 pp. 58 plates, numerous text-figures. (F. Warne & Co., London), 1949. 17s. 6d.

The first edition of this authoritative work, which was published in 1937 (R.H.S. JOURNAL, 62, 546-547), went out of print towards the end of 1945, and the publishers have wisely reprinted the book. The format resembles that of the first edition, but some alterations and additions have been made to the Key to the British species of *Odonata*, together with certain emendations and explanations on other matters.

All the original illustrations are included, together with 16 new coloured plates. The book is profusely illustrated by photographs and line drawings showing anatomical structure, venation, genitalia, body markings and the anal appendages of the nymphs.

The distribution records have been brought up to date (1947), and a map giving the list of vice-counties has allowed a concise distribution paragraph to be added to each species.

This book remains the standard Handbook on the identification of the British *Odonata*, and the price, though advanced by 10s., is a reasonable one for a work that is a happy combination of critical systematics and natural science.

G. FOX WILSON

"In Praise of Flowers." By Sir William Beach Thomas with reproductions of paintings by Frank O. Salisbury. Cr. Quarto. Illus. (Evans Bros.) 21s.

This book contains sixteen full page half-tone reproductions in colour of paintings of flowers by Mr. Frank Salisbury, the portrait painter. These are arranged in vases with one exception, that of a group of water-lilies, and this seems to your reviewer the most successful of the paintings. Each picture is accompanied by a short essay from Sir William Beach Thomas, essays liberally besprinkled with a number of charming and appropriate quotations. The plates and articles include Magnolias, Lupins, Roses, Tulips, Wistaria, Gladioli, Lilacs, Iris, Rhododendrons, Vines, Water-Lilies, Delphiniums and Lilies.

"Allotment Tobacco Growing." By J. H. Burn-Murdoch. 21 pp. Illus. (Vanguard Press, St. Annes-on-Sea, Lancs.) 2s.

"Baccy: grow and smoke your own." By "Charles Wyse-Gardner." 27 pp. Illus. (Intensive Gardening Press, Chertsey, Surrey.) 1s. 6d.

These two pamphlets should be helpful to the many who are now interested in the cultivation and curing of tobacco on a small scale.

"Swiss Alpine Flowers." By Walter Rytz-Miller, translated by William T. Stearn. 64 pp (Hallwag Publishers, Berne, 1949.) 4 Swiss francs.

This English translation of a handy, pocket-sized, illustrated booklet on Swiss alpine flowers will be welcomed by the increasing number of holiday-makers who are able to spend a week or two in the Swiss Alps. There is a general introduction, followed by brief, but accurate and adequate, descriptions of a selection of the more attractive species, arranged by colours. In the index the authorities for the Latin names are given and, despite its unpretentious aims, the book is written in a scholarly way. The majority of the illustrations are useful aids to identification, but some of the colours are not a success, notably those of *Orchis ustulata* and *Campanula thyrsoides*.

J. S. L. GILMOUR

"Making Floristry your Business." By Angela Johnson. Cr. 8vo. pp. 102. Illus. (Southern Editorial Syndicate Ltd. Southend. Distribution, Vawser & Wiles Ltd.) 6s.

The author points out that a qualified florist will need to serve an apprenticeship of anything up to four years. This little book deals with the subject primarily from a woman's point of view and tries to show what the openings for qualified florists are and what the work consists of. As she rightly remarks, it is a highly skilled trade. This little book, in spite of its over-florid jacket, should be of use to all those who are intending to embark on floristry as a career. There are useful descriptions of the basic technique of wreath-making, posy-making, bridal bouquets and other such examples of the florist's art.

"Flowers for Cutting." By G. A. R. Phillips. (Winchester Publications.) 5s.

In this little book of less than 100 pages there is a wealth of information for a beginning Gardener and even some reminders for the more experienced. There are lists of the many flowers and shrubs for all seasons and much instruction as to how and

where to grow them. Also a good many suggestions of how to use them for house decorations. The photographic illustrations vary. Two are very good, one being an arrangement of 'Malus blossom,' done in a Japanese style and the other of a vase on a pedestal with hanging trails of growth. It would be hard to believe that the other illustrations were arranged by the same person as most of them seem too crowded and designless and a few appear decidedly top heavy for the receptacle they are in. The roses in a mug look quite unhappy in it. There is a good index.

F. GALSWORTHY

"The Seasons Through." By Stuart Maddox Masters. 198 pp. (Herbert Jenkins Limited.) 7s. 6d. net.

In this good-humoured little book Mr. Masters gives a light sketch of his first year, from one September to the next, in his own garden. He writes gaily of his flowers and vegetables, of his bees, and of his friendly neighbours. The garden was an old-established one, but neglected. He knew little to begin with, but with cheerful enthusiasm he describes what he learned *The Seasons Through*.

J. W. HUNKIN

"Collected Flower Pieces." By Helen Blaxland. 64 pp. Illus. (Ore Smith, Sydney; Wadley & Ginn, London.) 27s. 6d.

This publication from Australia will be a decided help and inspiration for anyone who is fortunate enough to get hold of the volume not entirely on account of the actual flower arrangements but also for their positions and surroundings in the rooms. The most striking features of this book are the particularly good photographic illustrations. In most cases the beauty of the picture is arrived at chiefly by the excellent lighting by the photographer. An especially good one is on the top of page 17. Page 63 has arrangements rather in a Japanese manner which shows a restraint which is entirely pleasing and interesting, particularly the one in a flat dish or "Suihan."

Within the last twenty years or so the Royal Horticultural Society has encouraged by examinations and competitions the setting up of flowers for house and other decorating, and it is good to see that in Australia there are people who take their flower arrangements in an interesting way which they certainly do in America and which in Japan is an art and almost a religion.

In this book the illustrations show that they have been made up by various people who have also contributed a short comment to give their respective views, many of which are sound and sensible but too much reliance is made on accessories. Nobody surely who grows flowers should approve of tying up a bunch with ribbons and putting it on top of a bird cage without water so that the flowers would so soon fade and die. It seems a kind of floral murder!

F. GALSWORTHY

"The Citrus Industry, Vol. II. The Production of the Crop." Edited by L. D. Batchelor and H. J. Webber. xviii + 933 pp. Illus. (University of California Press, Berkeley, \$10: Agents—Cambridge University Press, 55s.)

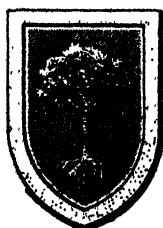
This is the second of three volumes which, when complete, will constitute the most comprehensive and detailed work on Citrus that has yet appeared. The first volume, published in 1943, dealt with *History, Botany and Breeding*, the second or present volume with *Production of the Crop*, while the third volume is to cover *Harvesting, Marketing and Utilization of the Crop*. The different sections or chapters have been written by specialists in the various aspects of Citrus fruit production in the United States.

The earlier part of the present volume is devoted mainly to matters relating to cultivation, the chapters on rootstocks, their characters and reactions, being particularly informative. Six chapters deal with pests and diseases, this all-important factor in Citrus fruit production being very fully covered. The book is well illustrated, a number of colour photographs being used to emphasize the effects of certain mineral deficiencies and fungoid diseases. This new work should prove of special value wherever Citrus is seriously cultivated and to anyone interested in this important group of fruits.

F. N. HOWES

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXXV



Part 2

February 1950

THE SECRETARY'S PAGE

ANNOUNCEMENTS—FEBRUARY AND MARCH

Shows, Lectures and Meetings

TUESDAY, JANUARY 31. 12 NOON TO 6 P.M.

3 P.M. LECTURE: *An Expedition to Nepal* by Mr. Oleg Polunin.

WEDNESDAY, FEBRUARY 1. 10 A.M. TO 5 P.M.

TUESDAY, FEBRUARY 14. 12 NOON TO 6 P.M.

3 P.M. *Annual General Meeting*, Lecture Room, New Hall.

WEDNESDAY, FEBRUARY 15. 10 A.M. TO 5 P.M.

TUESDAY, MARCH 7. 12 NOON TO 6 P.M.

3 P.M. LECTURE: *Cool Greenhouse Orchids and Methods of Cultivation for the Week-end and Evening Gardener* by Mr. D. F. Sander.

WEDNESDAY, MARCH 8. 10 A.M. TO 5 P.M.

TUESDAY, MARCH 21. 12 NOON TO 6 P.M.

3 P.M. LECTURE: *Rock Garden Plants* by Mr. W. G. MacKenzie.

WEDNESDAY, MARCH 22. 10 A.M. TO 5 P.M.

Annual Report—The Annual Report and Accounts are published in this number, and will be presented by the President at the Annual General Meeting on Tuesday, February 14, at 3 P.M., in the Lecture Room of the New Hall. The President will also present the Annual Awards for 1949.

Programme of Meetings—The programme of meetings arranged for the coming year was given in the November (1949) number of the JOURNAL.

Demonstrations at Wisley—There will be no practical demonstrations at the Gardens during February, but the following demonstrations will take place in March:—

Flower Garden

March 8, 9. Pruning of Roses and Shrubs.

March 15, 16. Seed Sowing and Vegetative Propagation of Alpines.

Fruit Garden

March 22, 23. Spring Spraying of Fruit Trees.

British Society for the Promotion of Vegetable Research, National Vegetable Research Station—At the first General Meeting of the Society, held in London recently, the following Governing Members were appointed to the Executive Committee: Dr. H. V. Taylor (Chairman), nominee of the Minister of Agriculture; Professor F. T. Brooks, nominee of the University of Cambridge; Professor W. Brown, nominee of the Royal Society; Mr. J. S. W. Cracknell, nominee of the Horticultural Trades Association; Mr. E. H. Gardener, nominee of the National Farmers' Union; Mr. G. G. Hole, nominee of the National Farmers' Union; Mr. R. L. Scarlett, nominee of the Secretary of State for Scotland; Mr. F. A. Secrett, nominee of the Royal Horticultural Society; Professor R. H. Stoughton, nominee of the University of Reading; Professor T. Wallace, nominee of the University of Bristol. In addition, sub-committees were appointed to deal with the undermentioned aspects of the Station's work: Staff and Research, Buildings, Farm Management and Research on Watercress.

WISLEY IN FEBRUARY

THE vicissitudes of the weather must be studied carefully before visiting Wisley this month for one sharp frost can make all the difference between an enjoyable and a depressing visit. On February 17, 1948, one hundred different species and varieties of plants in flower were cut from the open ground at Wisley and exhibited at Vincent Square, while two days later frost and a snowstorm had destroyed all but the sturdiest. Nevertheless, it is a month full of promise for the gardener as he watches the plants once again start into growth.

The first of the Rhododendrons will be coming into flower this month, when under favourable conditions there may be as many as twenty different species and varieties blooming. In the wood on Battleston Hill *R. × 'Christmas Cheer'* can be seen, the pink buds fading to white as they expand. One of the earliest to flower, it makes a very good plant for forcing. There are also some large plants of *R. arboreum* and *R. × 'Nobleanum'*, a grand old hybrid raised as early as 1835, but still worthy of cultivation, especially in milder parts of the country. Just over the lower bridge on Battleston Hill is a well-shaped tree of *Prunus subhirtella* var. *autumnalis* which has been flowering spasmodically since November. A group of *R. lutescens*, their delicate beauty offset by a background of other dark-leaved Rhododendrons, is scattered with primrose-yellow flowers like brimstone butterflies. Beside the path

which slopes into the dell grows *R. × 'Tessa' (praecox × moupinense)* with lilac azalea-like flowers. At the foot of the dell *Mahonia japonica* and *M. napaulensis* are carrying long sprays of sweetly scented sulphur-yellow flowers above their prickly leaves. In the beds on the far side of the upper bridge numerous *Rhododendron* species are arranged in beds according to their series, which are the groups into which they have been divided according to their botanical characteristics. Here are to be found *R. irroratum*, a fine *Rhododendron* for sheltered gardens, the white flowers suffused and spotted with deep rose, and *R. leucaspis*, whose blossoms are easily damaged by frost although the plant itself is perfectly hardy. The shield-shaped flowers are pure white with noticeable chocolate anthers. Other *Rhododendrons* which may be expected to be in flower, to mention only a few, are *R. × 'Bo-Peep' (lutescens × moupinense)*, *R. × 'Bric-a-Brac' (leucaspis × moupinense)*, *R. × 'Choremia' (haematodes × arboreum)* and its close relation *R. × 'Corma' ('Choremia' × chaetomallum)*.

The way to the Alpine House lies across Weather Hill, past the top of the Rose borders where two trees of *Prunus Conradinae* var. *semiplena* will be flowering towards the end of the month. This variety is far superior to the type, for the flowers are pink instead of white, last longer, and are more resistant to bad weather. At the lower margin of the old fruit plantation another early-flowering species, *P. Davidiana*, an ornamental Peach, is to be seen in flower.

In the Alpine House there are many Saxifrages coming into bloom, the bulk of the display being created by *Saxifraga Burseriana* and its numerous varieties. This very pretty plant is a native of the Dolomites and in consequence demands alkaline conditions for growth. The white saucer-shaped flowers are carried on short stems above mounds of glaucous blue leaves. *S. Grisebachii* is another fine plant, but of an entirely different character. The small bell-shaped corollas are set in brilliant crimson-scarlet calyces subtended by short red bracts forming a nodding spike suggesting some strange species of *Ajuga*. Several of the smaller Narcissi are flowering, such as *N. nanus*, and *N. asturiensis*, known in gardens as *N. minimus*, under which name it has been a favourite for many years, being the smallest Trumpet Daffodil in cultivation. Pans of *N. calcicola* are a delightful sight; it has the typical rush-like foliage of the Jonquil group and deep yellow flowers. Splashes of yellow are also created by the be-ruffed flowers of the hybrid *Eranthis Tubergenii (hyemalis × cilicica)*. Although there are here several well-grown pans of *Iris reticulata*, the spectacle of it flowering valiantly in the open, even with snow on the ground, may give more pleasure to the beholder in that it is able to do without man-made protection.

Beside the round pool at the top of the Rock Garden the inconspicuous, but sweetly scented flowers of *Sarcococca Hookeriana* var. *digyna* are clustered among the evergreen leaves. Among other flowers here is the giant Snowdrop *Galanthus Elwesii*, *G. byzantinus* and the Snowflake, *Leucojum vernum*. Patches of Crocuses splash the cold earth with colour while the yellow-margined leaves of *Elaeagnus pungens* var. *maculata* gleam in the sunshine, appearing from the distance to be like some precocious Forsythia.

In the Wild Garden there will be flowers on *Rhododendron* × *praecox* during mild spells, as there will be on two fine old trees, *Pieris japonica* and *Hamamelis japonica* growing side by side on the eastern edge of the wood. Both the typical mauve and the white form of *Daphne Mezereum* should be in flower although the soil conditions are not really to their liking, and the ditches are full of the tightly packed mauve flower-heads of *Primula denticulata*.

In Seven Acres are more *Hamamelis* species, scattered flowers on the Forsythias and Japanese Quince, and the trusty spring-flowering heathers such as *Erica* × *darleyensis* and *E. mediterranea*. In the Viburnum collection extensive plantings of Winter Aconites have been carried out. With its early-flowering habit and unobtrusive leaves this is an ideal plant for naturalizing under deciduous shrubs.

Under the Willows beside the Round Pond the root-parasite *Lathraea Clandestina* is established and producing pale violet flowers which although more handsome than most of the Toothworts still have that somehow repulsive appearance so frequently found among parasitic plants. Native of the west and south of France, Spain, Belgium and Italy, its usual hosts are Poplar and Willow.

In the Award of Garden Merit Collection is a fine plant of *Cornus mas*. The twiggy branches are packed with tiny bright yellow flowers which are unfortunately seldom followed by the fruits to which it owes the name of Cornelian Cherry.

Making in the direction of the Bamboo Walk the way leads past a plant of the Japanese *Stachyurus praecox*, the yellow flowers hanging in short tassels in bare arching branches.

Two plants among those trained against the frameyard wall are flowering, the white-flowered, Forsythia-like *Abeliophyllum distichum* and *Clematis balearica* whose silky yellow flowers have been appearing spasmodically since late November, while at their feet cheerful Crocuses are poking through the soil. In the glasshouses the plants in flower are practically the same as those to be seen last month, although in the Trials House the Primulas should be reaching the peak of their display.

Beneath the Laboratory walls there is one plant which visitors should not fail to see, the yellow form of the Wintersweet, *Chimonanthus praecox* var. *luteus*. It is a superior plant to the typical form, which is to be found growing a little nearer the entrance, thus enabling the two to be easily compared.

THE GARDEN IN WINTER

Patrick M. Syngé

(Lecture given on November 1, 1949, MR. W. BENTLEY in the Chair)

THE Garden in Winter is a big subject, nearly as big as the Garden in Spring or in Summer, and so I would like to begin this paper by defining its scope. This paper does not deal at all with the work that we should be doing in the garden during the winter. That is a subject sufficient for another full paper. Rather, I want here to describe some of my favourites among the Winter-flowering plants and some combinations and pictures which can be made from them. It has always been a matter of surprise to me that so few Winter-flowering plants are grown in the average small garden. Perhaps they do not have the same size of flower or flaunting brilliance of colour as many Summer flowers. Yet in many cases they have much more scent and are doubly valuable for the season at which they flower. My chief difficulty in preparing this lecture has been what to leave out, rather than in finding enough plants to write about.

English weather and seasons are, as we all know, very variable, and so I would like to define my use of the term "Winter" as the season between the middle of December and the end of March. Towards the end we will be running fast into Spring. The plants I will describe can nearly all be grown in gardens in the home counties around London. Many more still can be grown in the South-West and Cornwall or the West of Scotland. They are very nearly all plants which will not normally be harmed by frost although of course if the frost comes when they are in full flower, that particular crop of flowers will be lost; but generally they will open more and we have so many mild spells that it is a gamble, to my mind, well worth taking. All the flowers I describe I have seen myself in English gardens during the past three years and the majority of them are easy to obtain.

Many will remember the exhibit of 100 flowers picked from the open at Wisley that was shown in mid-February, 1948. This excluded the *Crocus* species which would have swelled the grand total further since it is one of the most abundant and fruitful of the genera that flower in Winter and early Spring. Here were *Prunus*, Heathers, *Hamamelis*, *Rhododendrons*, *Narcissus*, *Snowdrops* and many others. The complete list will be found in the *JOURNAL* for April 1948. It was a specially favourable spell but in a normal season the same flowering might be expected, only it would be spaced over a longer period.

A necessary background to the Winter garden is good design and trees of good form and it is in Winter that we are especially conscious of this. One of the best gardens I have seen recently in this respect is that at Hidcote Manor, which was the first garden to be given to the Gardens Committee of the National Trust and the R.H.S. and which was so ably described in the *JOURNAL* for November, 1949, by MISS V. SACKVILLE-WEST. Here was a number of small intimate gardens contained within the larger garden, close to the house and backed by evergreen hedges and a small amount of formal topiary. The value of evergreens is particularly apparent in Winter and there are few to rival the beautiful Cedars, particularly the glaucous *Cedrus atlantica glauca*. The great

Cedar at Hidcote was planted on ground slightly higher than some parts of the garden round it and this enhanced its value and beauty (Fig. 174, R.H.S. JOURNAL, November 1949). It is only in recent years that I have appreciated also the value of the yellow-green Conifers in the Winter garden, especially the smaller ones in the Rock garden. Every gleam of sun seems to light them up and bring warmth and colour to the garden, an effect which cannot be obtained with the glaucous Conifers. The deep rich greens of *Pinus radiata* (*P. insignis*) with their highlights and black shadows are also a great addition to the Winter garden and it is a very fast-growing tree.

Another tree, in which I always take special delight both Winter and Summer, is *Picea Breweriana* in which the rich green branchlets droop in great swirls, like a lady's dress with flounces (Fig. 22). It is one of the few trees which look even better when it is raining and when each branchlet drips little streams of water. It is, however, a slow grower as a young tree. The golden barked Weeping Willows complete the picture of any pond or river bank and are some of the earliest trees to show a shimmer of green. There are magnificent examples, placed to perfection, both at Wisley and at Kew beside the lakes, but it is not necessary to have a lake to grow these Willows. Their growth will be quite good in places where their roots are not able to reach the water. The silvery trunks and feathery branches of Silver Birches are also beautiful in Winter.

The value of coloured bark, of berries and of catkins is also enhanced at this season. *Prunus serrula* var. *tibetica* is one of the finest trees in this category. Its bark is a rich mahogany in colour and it repays the peeling off of the old bark and even polishing, as does a fine table and it is possible to obtain almost the same effect (Fig. 21). There is a story of one gardener, who had a short avenue of these trees, and kept a duster handy in the crook of one and gave the trunks a polish each morning on his round of the garden. Unfortunately the flowers of this Cherry are very small and inconspicuous.

Among the Maples there is also a number of species with fine bark. There is *Acer griseum* with mahogany-coloured bark and *A. Davidi* with green bark handsomely striated as a snake's skin. In fact this section of Maples is often known as the Snake-barked Maples. These trees should be encouraged to make at least a 6 to 8 foot stem before the side branches are allowed to develop. Then there are the yellow- and the red-barked Willows, *Salix vitellina* and its variety *britzensis* and the red-barked forms of Cornus, rather illogically named *Cornus alba*. The 'Weston-birt variety' is probably the finest of the red-barked Cornus. Both the Willows and the Cornus bear their finest colour on the young shoots of the previous year and so should be pruned back hard each year.

For berries there is no need to extol the Holly further. There are few better trees for Winter effect. Berried shrubs seem to vary considerably in the attraction which their berries offer to birds. One plant which nearly always maintains its berries until late in February is *Cotoneaster conspicua* var. *decora* and it was recently given an Award of Garden Merit (Fig. 24). The variety has arching, slightly pendulous branches. KINGDON-WARD who discovered this species in S.E. Tibet described it as a "bubbling red cauldron of berries." Amongst the

THE ROYAL HORTICULTURAL SOCIETY

ESTABLISHED 1804.

INCORPORATED 1809.

NOTICE IS HEREBY GIVEN that the ONE HUNDRED AND FORTY-SIXTH ANNUAL MEETING of the Fellows of the Society will be held in the LECTURE ROOM, NEW HALL, GREYCOAT STREET, WESTMINSTER, on Tuesday, February 14, 1950, at 3 P.M. precisely, for the purpose of receiving the Report of the Council for the past year, and electing a President, ten Vice-Presidents, a Treasurer, three Members of Council, and an Auditor.

By Order of the Council,

C. V. L. LYCETT,

Secretary.

THE ROYAL HORTICULTURAL SOCIETY'S HALL,
VINCENT SQUARE, WESTMINSTER, S.W. 1.
January 14, 1950.

ANNUAL MEETING

To be held at 3 P.M., February 14, 1950

AGENDA

Minutes of the last Annual Meeting, held February 15, 1949.

Report of the Council.

President's Address.

Treasurer's Statement.

Adoption of Report of the Council.

Election of President.

Election of Vice-Presidents.

Election of Treasurer.

Election of Three Members of Council.

Election of Auditor.

Presentation of the Victoria Medals of Honour.

Presentation of Associate of Honour Badges.

Presentation of the Veitch Memorial Medals.

Presentation of the Loder Rhododendron Cup.

Presentation of the A. J. Waley Medal.

Presentation of the Lawrence Medal.

Presentation of the Holford Medal.

Presentation of the Williams Memorial Medal.

Presentation of the George Moore Medal.

Presentation of the Sander Medal.

Presentation of the Reginald Cory Memorial Cup.

LIST OF NOMINATIONS

The following list of nominations of President, Vice-Presidents, Members of the Council and Officers for election is circulated in accordance with Bye-law 58:

	<i>Proposed by</i>	<i>Seconded by</i>
<i>As President:</i>		
LORD ABERCONWAY, C.B.E., LL.D., V.M.H.	Mr. E. A. Bowles.	The Hon. David Bowes-Lyon.

<i>As Vice-Presidents:</i>		
Lieut.-General His HIGHNESS THE MAHARAJA OF JAMMU AND KASHMIR, G.C.S.I., G.C.I.E., K.C.V.O. Field-Marshal THE RT. HON. JAN C. SMUTS, P.C., C.H., K.C., F.R.S. Professor L. H. BAILEY, LL.D., Litt.D. Mr. E. A. BOWLES, M.A., F.I.L.S., F.R.E.S., V.M.H. Dr. ERNST H. KRELAGE. Mr. F. CLEVELAND MORGAN. Mr. B. Y. MORRISON. Mr. C. G. A. NIX, V.M.H. Colonel THE HON. SIR HEATON RHODES, K.C.V.O., K.B.E. SIR WILLIAM WRIGHT SMITH, M.A., F.R.S., F.R.S.E., F.I.L.S., V.M.H.	}	Lord Aberconway. The Duke of Devonshire.

<i>As Members of Council:</i>		
The Hon. DAVID BOWES-LYON	Mr. F. A. Secrett.	Mr. J. B. Stevenson.
The Hon. LEWIS PALMER	Major A. Pam.	Mr. G. W. Leak.
Mr. A. CHPAL	Col. F. C. Stern.	Dr. H. V. Taylor.

<i>As Treasurer:</i>		
The Hon. DAVID BOWES-LYON	Mr. G. Monro.	Mr. R. D. Trotter.

<i>As Auditor:</i>		
Mr. F. G. Feather, F.C.A.	Mr. E. P. F. Sutton.	Mr. W. Bentley.

By Order of the Council,
 C. V. I. LYCETT,
Secretary.

Thorns, *Crataegus* × *Carrierei* and *C. durobrivensis* both bear large scarlet fruits which generally hang until February. There is a good specimen of the former in the Award of Garden Merit Collection at Wisley, a part of the garden which is very rich in Winter-flowering plants. The yellow berries of the sea-buckthorn *Hippophae rhamnoides*, the deep rose pink fruits and blood-red seeds of *Euonymus semiexsertus* and the scarlet berries of *Skimmia japonica* are also worthy of a place in the majority of gardens. Both male and female plants of the sea-buckthorn and the *Skimmia* must be planted since they are dioecious.

Among the catkin-bearing plants, the species of Willow are pre-eminent and I particularly recommend *Salix purpurea*, the purple Osier with its little upright catkins and dull reddish anthers, generally freely produced in January, while *S. daphnoides* is a magnificent species with large silvery pussy-like catkins on plum-coloured branches which are often covered with a faint white downy bloom (Fig. 23). *Garrya elliptica*, an evergreen, is also worth growing for the long pendulous catkins, suede grey in appearance ringed with faint yellow in the male catkin where the anthers emerge. The catkins last for a very long period on the bushes.

My two indispensable plants, that will flower throughout the Winter, are both old and well known; *Iris unguicularis*, more familiarly known just as the 'Stylosa' Iris and *Jasminum nudiflorum*. The former is a native of the southern Mediterranean and can be seen flowering during the Winter in the Pine woods around Algiers. In this country, however, the best place is against a south wall; if it can be planted against the wall of a greenhouse which is heated or the chimney of the house, the flowers will be even earlier. There are several variant colour forms. The finest I have ever seen is 'Ellis's Var.', which was given an Award of Merit recently. The flowers were described as deep-sapphire blue. This Iris is not always so successful on heavy soils and in such cases I would recommend planting it on a small mound or raised bed, possibly of a lighter compost than the surrounding soil. A small amount of John Innes Potting Compost with the addition of extra coarse sand or even chips should provide a good medium for it.

The yellow Jasmine is best hard pruned during the Winter by cutting sprays for the house, where the red flushed buds will quickly open to clear yellow flowers. The more you cut, the thicker it will grow next year. This Jasmine was collected by ROBERT FORTUNE just 100 years ago, when on an expedition to China on behalf of the Horticultural Society of London, the predecessor of the R.H.S. FORTUNE was given elaborate instructions for his expedition and told to look for "Paeonies with blue flowers and Camellias with yellow flowers" among other things. He did not find them but the yellow Winter Jasmine is a fine memorial for any collector.

A combination which is often very effective around the New Year is the yellow *Hamamelis mollis* with the purple *Rhododendron mucronulatum*. *H. mollis* is, in my opinion, the best of the Witch Hazels and seems extremely resistant to frost, often starting to flower in late November and continuing till the middle of February. Small plants flower but sometimes the effect is rather thin and spidery, but on an older plant, such as the one in the Award of Garden Merit Collection at Wisley or the tree at Myddelton House, illustrated in the JOURNAL for March

1949, the yellow twisted strap-like petals provide a strong mass of colour which is most welcome at this time. They appear on the bare branches as little pieces of yellow tissue-paper gathered together at the base into a minute ragged posy. They twist in all directions like a tortured Medusa's head. Again they are best seen against a dark background, as is also the fine lemon yellow *H. japonica* Zuccariniana. Both these species also have the added advantage of good Autumn colouring, the hazel-like leaves becoming deep yellow before falling, sometimes tinged with orange-red.

Rhododendron mucronulatum succeeds with me more often than does *R. × Nobleanum*, and although it is not so showy, I prefer the more delicate *R. mucronulatum*, which is practically deciduous as an Azalea. There is a fine plant of a rather light-coloured form of this at Wisley on Battleston Hill near the lower bridge where a number of Winter and early Spring-flowering plants have been collected.

The genus *Viburnum* also provides us with several fine shrubs which will flower in December and January. *Viburnum fragrans* is certainly the most commonly grown and the planting of this in a group backed by darker evergreens as at Myddelton House (illustrated in the JOURNAL for March 1949), seems the most effective way of growing it since by itself it is rather a formless shrub. I prefer the pink tinged forms to the pure white ones, but it is rather a variable plant. The underplanting with *Cyclamen neapolitanum* so that the ground is completely covered with the beautiful and varied leaves during the winter, is a particularly happy combination, while the Summer mulching with leaf mould of the Cyclamen will also benefit the *Viburnum*. I have found that it is a plant rather sensitive to Summer drought. Even finer than the species is the new hybrid *V. bodnantense*, raised between *V. fragrans* and *V. grandiflorum*, and this promises to be a very valuable addition to our Winter-flowering plants (Fig. 25). The flower heads are rather larger than those of *V. fragrans* and the pink colour is slightly deeper. *V. grandiflorum* with its pink-flushed flowers and the white *V. foetens* are also worth growing where they can be given some shelter, preferably from a wall in the home counties, but it is difficult to prevent large expanses of bare wood from being very visible with the flowers at the end of long branches. They also are fragrant, but not so strongly as *V. fragrans* or *V. bodnantense*.

Chimonanthus praecox (*fragrans*) is another excellent January-flowering plant with perhaps the finest scent of all. I particularly recommend the variety *luteus* which has slightly larger flowers than the species and much more yellow colour in them. It was a fine sight in the border outside the laboratory at Wisley last year and had a long season of flowering.

The shrubs I have described so far have been deciduous, but *Mahonia japonica* can be recommended as a good Winter-flowering evergreen. There has been some confusion over the nomenclature of this species. *M. japonica* is the species with long horizontal racemes of pale yellow scented Lily-of-the-Valley-like flowers, while *M. Bealei* is the species with rather shorter upright racemes. I think the former is preferable. There is a very fine plant of this near the entrance to the Wild Garden at Wisley and the flowers seem to be extremely resistant

to frost. *M. lomariifolia* is perhaps a finer plant yet and flowers in December and January, but it is more tender except in sheltered gardens.

Some of the forms of *Erica carnea* are also very frost-resistant and will provide welcome colour as an underplanting to the Hamamelis, Viburnum and Chimonanthus. 'King George' is a December-January flowering variety with deep crimson flowers. 'Queen Mary' has good deep pink flowers while 'Springwood White' is a very reliable white variety. For slightly later flowering I would recommend the deep crimson 'Vivelli.' A thick carpet of these Winter-flowering heaths will also be a good labour-saving investment since few weeds will grow through, but if you want to grow good shrubs and a good carpeter off the same ground it is most desirable to give them a generous mulching of compost or leaf mould every year.

Erica arborea alpina associates very pleasantly with these very early-flowering shrubs and the bright yellow-green of its foliage is appreciated in Winter while in the later half of March it should flower. It seems to be a very hardy variety and the Frost Damage Survey of the plants injured in the severe winter of 1946-47 did not bring any records of its damage, although there were several records of *E. arborea* being killed or cut to the ground.

Primula juliae and its fine hybrid Primula 'Wanda' will produce flowers at intervals during mild spells from December and a group of these as an underplanting to the Hamamelis will provide some of the strong colouring which tends to be rather lacking in Winter flowers. They will finish their season in March and April with an abundant mass of flower and rich colour. They are very easily propagated by division either in the Spring after they have flowered or in early Autumn.

The Hellebores are not gaudy or brilliant plants but their flowers are long lived and particularly in the case of the forms of *H. orientalis*, the so-called Lenten Roses, they have the merit of growing old gracefully. The white Christmas Rose, *H. niger*, named from the colour of its root, and its fine form *altifolius* repay a cloche to keep them clean, but this is unnecessary with the other species. One of the finest and probably the largest is the soft apple-green flowered *H. corsicus*, whose head of flowers often grows 2 feet in height and lasts in flower from February till April. The foliage is equally fine, large shiny leaves very sharply serrated and often bearing a slight white bloom. They alone would add distinction to any flower decoration.

The forms of *H. orientalis* vary enormously in size and colour and so should be chosen in flower. All Hellebores, however, are best moved when young and even after this they will probably not flower well until they have become established and so should be carefully placed where they are to remain. On the mountains beside Lake Como the Christmas Roses grow among the shrubs and as long as they can be well mulched, such a combination should suit them and appear more natural than any independent grouping. They mingle well also with drifts of Snowdrops, if one is lucky enough to possess the soil where Snowdrops will so multiply. The colour of Hellebores grades from greens and whites through pale pink and purples to the deepest maroon of *H. colchicus*, from Northern Asia Minor. This is a most handsome plant as dark as a 'Sultan' Sweet Pea or a *Lilium Martagon Cattaniae*.

are required for the other Snowdrops. They are excellent for scree frame or alpine house culture. For Christmas and early January flowering, *G. byzantinus* and *G. corcyrensis* are the two best species to choose, although stocks of both are not very common in the country. *G. byzantinus* is perhaps the larger flower of the two with icy-white drooping bells and has slightly folded or plicate leaves. During the end of the last century and the early years of this, a very large number of varieties of Snowdrops were raised by hybridisation and by selection. Many have died out but one of the finest, oldest and most vigorous is that known as *Atkinsii*, often called, though erroneously, *Imperati* var. *Atkinsii*. The flowers are considerably larger than those of the common Snowdrop and where once established it seems to spread very freely. Both this and the variety MR. BOWLES has called 'Straffan,' from its origin at Straffan House in Co. Kildare, are particularly fine in his garden at Myddelton House and are plants worthy of a wide distribution (Fig. 19). Of the later flowering species, I recommend *G. Elwesii* and the 'Warham' variety of *G. plicatus*. This latter was collected in the Crimea during the war there and sent back by a soldier and was awarded an F.C.C. in 1937.

Narcissus and Iris both give us Winter flowers of great beauty. *N. Bulbocodium monophyllum*, sometimes called *N. Clusii*, with clear white rather translucent flowers and *N. Bulbocodium Romeuxii*, and its smaller form *Riffianus*, with lemon-yellow flowers are two of the most lovely of the very variable hoop-petticoat species and flower two months earlier than the common species. They are native to the Atlas Mountains and are not so free flowering in this country as the later ones, but they are so beautiful and so early in flower that they are worth growing. They require frame or alpine house treatment except in the mildest counties. Good drainage is definitely an essential requirement for them and probably some Summer ripening, although I suspect they are better without complete baking.

Among the Irises, *Iris reticulata* is probably the easiest and the most permanent of the Winter-flowering species and recently a number of fine and varying colour forms have been introduced in addition to the well-known light-blue 'Cantab.' I have found that it survives in my garden from year to year in the grass at the edge of a bed better than in the bed itself. *I. histrioides* is another favourite of mine with its large porcelain-blue flowers and brilliant orange markings. It stands up so stoutly against the weather, as broad as high and like a miniature Oak; the three segments of the flower grow outwards almost at right angles to the stem, displaying the orange blotch and fleckings at the end of the falls. COLONEL STERN has told me that this Iris grows better in rich, vegetable garden soil, and not in the austerity of a rocky scree. From Highdown *I. Histrio* var. *aintabensis* was exhibited last Winter and COLONEL STERN has strongly recommended it as one of the very best of the Winter-flowering Irises for well drained positions, not so rich as those required for *I. histrioides*. The flowers are smaller, a pale, slightly slaty, porcelain-blue with strong yellow markings. *I. Danfordiae* is a strong yellow in colour with prominent falls and practically no standards, but I have always found that it flowers the first year from imported bulbs and then breaks up into so many little bulbs that it takes years to

reach flowering size again. I have still to learn the secret of its successful cultivation from year to year.

All these small bulbs are excellent in the Rock garden, the scree frame or alpine house. They do not require any heat.

During February some further shrubs should flower, opening out whenever there is a mild spell. One of the finest of the recent introductions is *Abeliophyllum distichum* from Korea. The flowers are bell-shaped, white, with a slightly warmer tinge towards the base and cover the branch in a well-grown plant. It is generally seen to the best advantage against a wall. *Cornus mas* covers itself with little clusters of yellow flowers about this time and looks very well underplanted with *Scilla bifolia*, one of the earliest and most dainty of this genus, while the *Daphne Mezereum* is worthy of a place in all gardens for its fine scent and long flowering season.

Chaenomeles lagenaria has unfortunately undergone a botanical game of musical chairs in its nomenclature. It is the plant formerly known as *Cydonia japonica*, while *Chaenomeles japonica* is the plant formerly known as *Cydonia Maulei*. Some fine varieties such as 'Knaphill Radiance' have been shown recently. These plants flower best when their young wood is kept pruned hard and when they are grown against a wall, but this is not necessary and they will form hardy, and thick, bushes in the open and for lime soils will in some measure take the place of Rhododendrons.

This leads us on to our four most spectacular genera of late Winter- and early Spring-flowering plants, namely Rhododendron, Prunus, Camellia and Magnolia.

The two low-growing species of Rhododendron, *R. moupinense* and *R. leucaspis* are both most charming plants with white and creamy-white flowers respectively. Flowering in February and early March their buds have a considerable power of frost resistance and the actual flowers a slight resistance although, of course, a severe frost will brown them. A position slightly sheltered from morning sun is, however, an advantage. Both of these also have the merit of flowering when small plants. The flowers are quite large, about two inches across, opening in *R. leucaspis* rather flat. *R. leucaspis* was only discovered by KINGDON-WARD in the Tsangpo Gorge of Tibet in 1924. It first flowered in this country as soon as 1928 and since then has become widely distributed. It is also an excellent plant for the alpine house.

As well as being beautiful in themselves, these two have been the parents of several very good hybrids, notably *R. 'Cilpinense'* raised at Bodnant between *R. moupinense* and *R. ciliatum* and *R. 'Bric-a-Brac'*, a hybrid between *moupinense* and *leucaspis*, which seems to combine the more desirable characteristics of both parents, being a compact, stout grower and usually flowering freely. *R. 'Cilpinense'* is a neat, rather dwarf grower with most attractive shining glossy leaves and buds tightly wrapped in pink scales. The flowers are very pale shell-pink and are magnificent during mild spells in March. For gardens in the West and South-West also, there has been developed a most attractive race of dwarf early-flowering hybrids with yellow flowers of which probably the finest are 'Chrysaspis' and 'Golden Oriole.' Paler in colour and

hardier is the cream-coloured 'Bo-peep' (*R. moupinense* × *R. lutescens*), while 'Seta' (*R. spinuliferum* × *moupinense*) has pleasing tubular creamy-white flowers tipped with pink and blooms freely in March. Among the lilacs and purples there is the old *R. praecox* and the newer 'Tessa.'

A very notable addition to the range of early-flowering deep blood-red hybrids is 'Choremia' (*R. haematodes* × *R. arboreum*) and this was given an F.C.C. when shown in the middle of February. Older scarlet hybrids for the latter half of March are *R. 'Cornubia'* and *R. 'Shilsoni'* and these are still worth growing, particularly the latter whose flowers are a fine clear colour. For the milder counties there are few finer plants than the deep blood-red forms of *R. arboreum* and its fine hybrid with *R. Thomsoni*, called 'Red Admiral' but these are too tender for the counties around London.

All through the Winter, whenever there is a mild spell, *Prunus subhirtella autumnalis* will open flower and a tree of this is a most valuable addition to any garden. Generally in Surrey, they start towards the end of November and finish up with a mass of bloom covering the tree in early March. The flowers are small, but make up for their size by their numbers and any bud showing pink will come out in water in the house. An interesting point about this Cherry is the length of the pedicels; often in early Winter I have seen the flowers almost sessile on the branches while by March the pedicels have developed to half an inch or more in length. It is important to choose the variety *autumnalis* for Winter flowering. The species is also a valuable plant for flowering in the latter half of March or early April, while the weeping variety *pendula* is particularly valuable when well placed over a rock or when shaped as an umbrella.

February and March usually bring some more of the earliest Cherries and Peaches into flower among which *Prunus Davidiana* and *P. Conradinae* are pre-eminent. *P. Davidiana*, which has both pale pink and pure white forms, grows into quite a large tree. The flowers are rather almond-like in form, single and up to an inch in diameter and are produced over the full length of the previous year's growth, albeit sometimes a bit spasmodically during mild spells. It fittingly commemorates PÈRE DAVID, one of those indomitable French white fathers who first discovered so many good plants from the far distant mountains on the marches of Tibet and China. *P. Conradinae* is generally a magnificent sight at Kew towards the end of February and there is a very big tree of it near the Victoria Gate. The flowers are slightly larger than those of *P. subhirtella autumnalis*, pale pink in bud, opening almost white, single in the species but semi-double in the variety *semi-plena*. This is the one I would recommend. The Almonds follow quickly and the earliest and the best is probably that raised in Australia and called *Pollardi*, its big clear pink flowers sometimes being the size of a half-crown. It is a most lovely sight when underplanted with the sky-blue *Anemone blanda*. The pale yellow hoop-petticoat *Narcissus Bulbocodium* and the stronger yellow *N. cyclamineus* also look well with them, especially where, as at Wisley, they can enjoy the damper places. There at the edges of the Wild Garden and in the Alpine Meadow they have naturalised themselves freely. *Prunus yedoensis*, *P. Sargentii* and *P. subhirtella* and its weeping forms will carry over the Winter season



PLATE 11. *Forward*

FIG. 19--*Galanthus* 'Stratlan Variety' and *Crocus Tomasmianus* in early February at Myddelton House (See p. 64)

THE GARDEN IN WINTER

FIG. 20 *Cyclamen* *Atkinsii* in early February at Myddelton House (See p. 63)





Photo. A. G. I. Heller

THE GARDEN IN WINTER

FIG. 21—*Prunus serrula* var. *tibetica* (See p. 58)



Photo, J. I. Doxey

THE GARDEN IN WINTER

FIG. 22 *Pucca Breckenana* in MR. R. D. TROTTER'S former garden at Leith Vale
(See p. 58)



Photo, H. Gernsheim

THE GARDEN IN WINTER

FIG. 23—Catkins of *Salix daphnoides* (See p. 59)



Photo, J. F. Downward

THE GARDEN IN WINTER

FIG. 24—*Cotoneaster conspicua* var. *decora* (See p. 58)

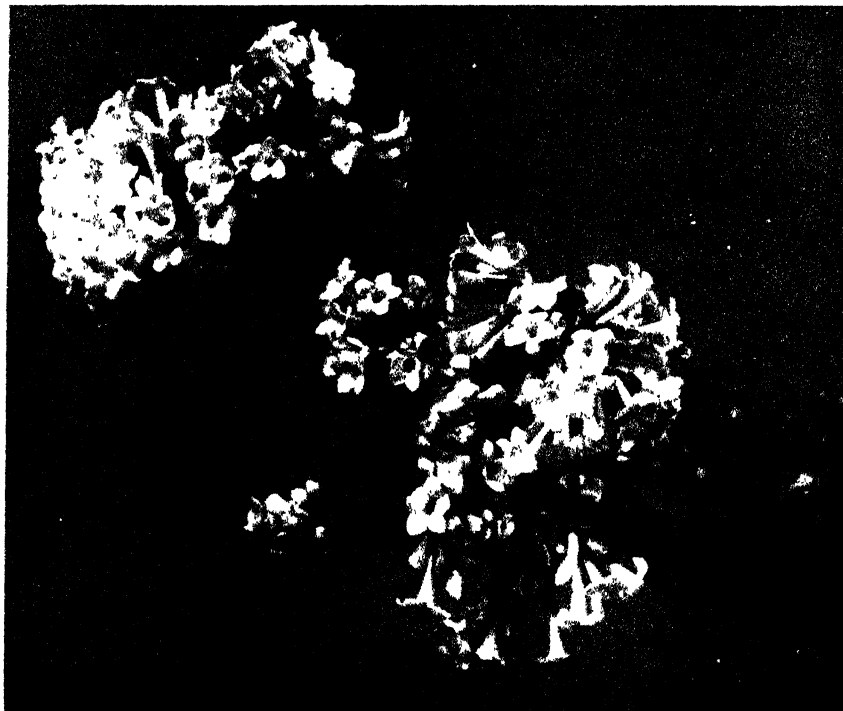
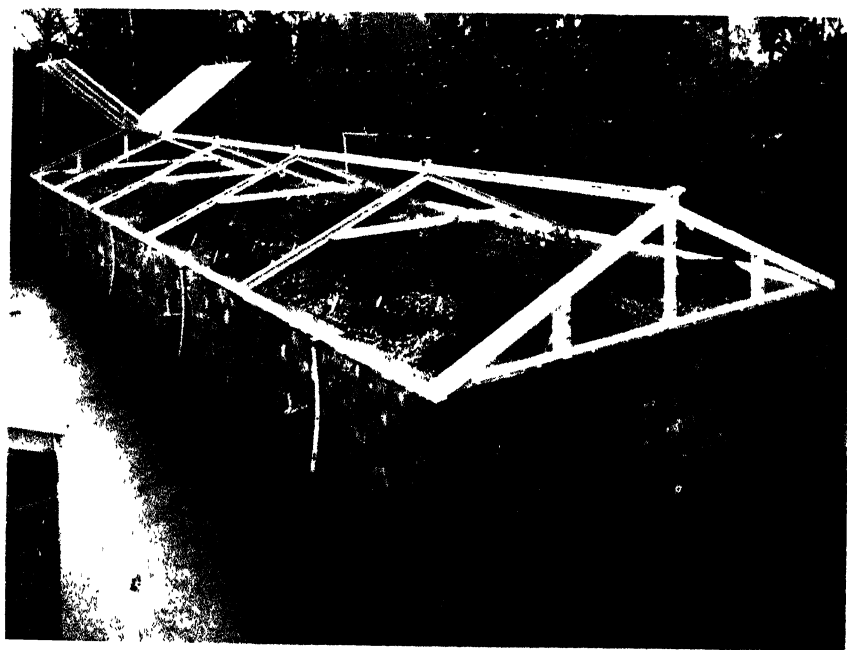


FIG. 25—*U'burnum bodnantense* (See p. 60)



THE GARDEN IN WINTER

FIG. 26 A raised frame with scree mixture suitable for winter-flowering bulbs. This frame is in MR. W. BENTLEY's garden at Quarry Wood, near Newbury (See p. 62)



THE SANDER MILDAL

FIG. 27- *Jasminum polyanthum*, F.C.C. March 15, 1949 Exhibited by
LORD ABERCONWAY, C.B.E., LL.D., V.M.H.



FIG. 28—MONTAGUE CHARLES ATWOOD, 1918.



VICTORIA MEDAL OF HONOUR, 1940

FIG. 29—ERNEST BAILLARD

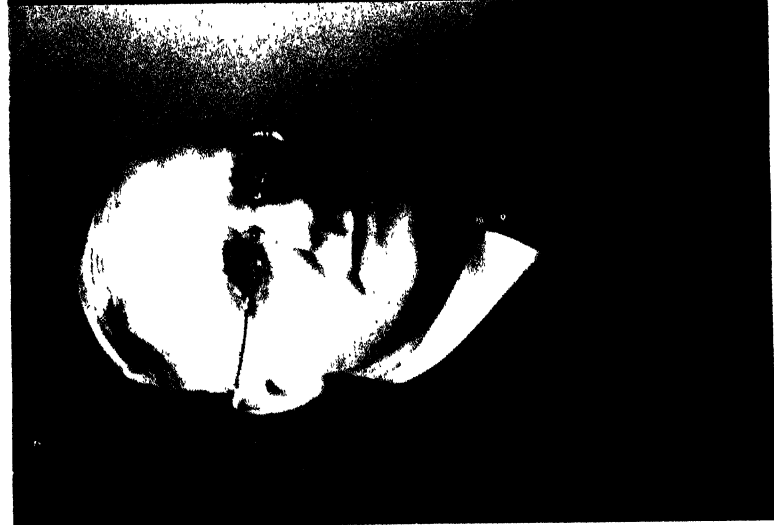


FIG. 30.—DR. JOHN RAMSBOTTOM, OBE, MA,
DSC, FRS.



VICTORIA MEDAL OF HONOUR, 1949
FIG. 31.—THE REV. CANON HORVOT ROFTO MAYER



FIG. 32.—DR. WIN RIDGWAY JONES



FIG. 33.—Tarsonemid Mite attack on *Erythronium* showing rolled foliage. (See p. 71)



FIG. 34. Tobacco showing symptoms of attack by the Broad Mite, *Hemiteles marginatus latus*. (See p. 71)

THE BROAD MITE

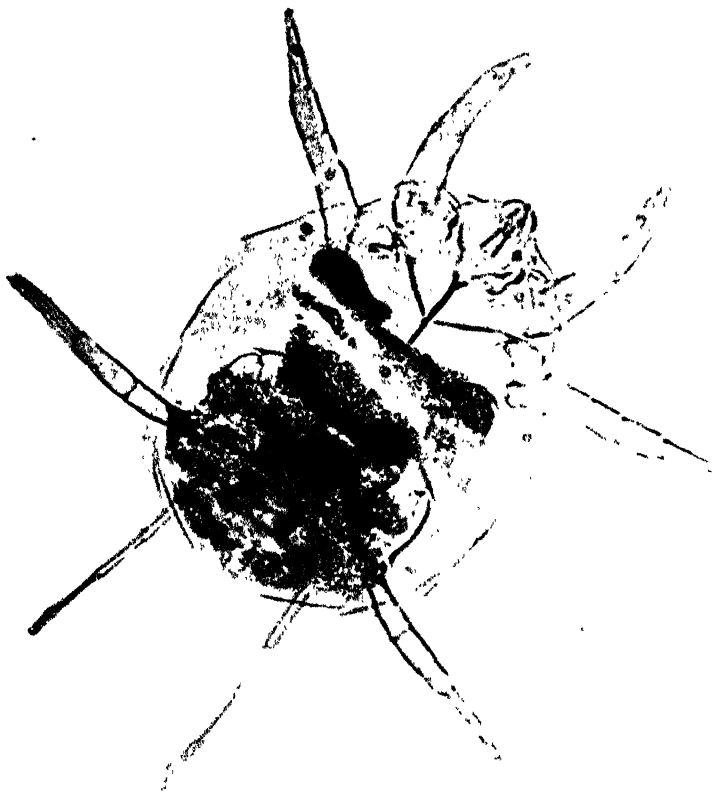


FIG. 35—Broad Mite, *Homitarsonemus latus* (Banks) TWISG., adult female from Fuchsia (X 300) (See p. 72)

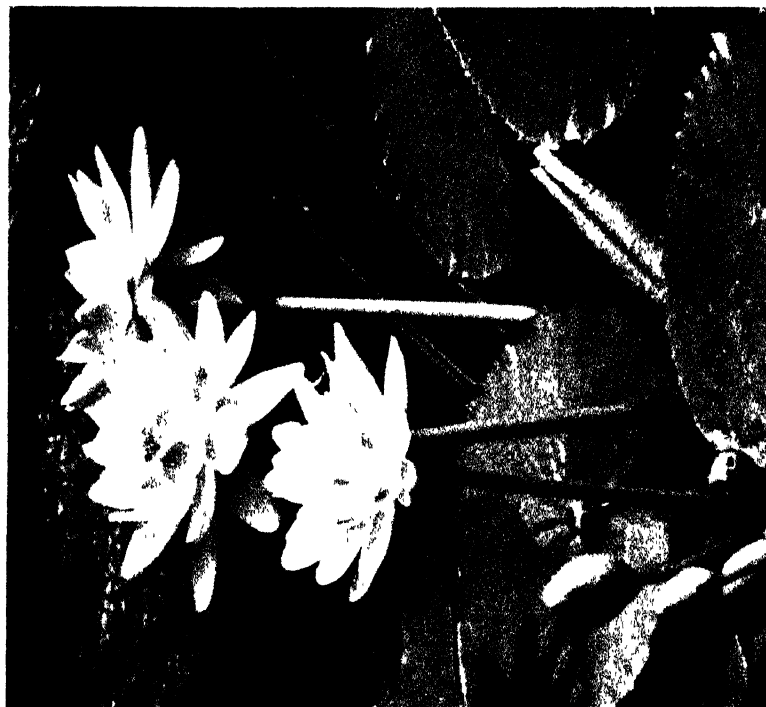


THE BROAD MITE

FIG. 36—Tarsonemid Mite attack on Begonia showing acute marginal leaf-roll (See p. 71)



Leaves, Mr. Ted J. at Oryx



NEW AND NOTWORTHY PLANTS

Figs. 37 and 38. Nymphaea gigantea alba (Soc. 1953)

into Spring. All these are excellent plants for the small garden, while *P. yedoensis* and *P. Sargentii* also give us brilliant colour effects in the Autumn. The ordinary Myrobalan Plum and the Blackthorn are excellent for the wilder part of the garden or the wide spreading hedgerow, but I do not recommend them for a hedge which has to be trimmed frequently. They both flower early as does also the copper-leaved *P. cerasifera atropurpurea* (Pissardii) but this seems to me a difficult plant to place to the best advantage. It is worth thinning the branches slightly so as to show the form and also to diminish the thick heavy mop of deep plum-coloured foliage which develops later and always seems to me to mingle so inharmoniously with the green of the garden.

Camellias and Magnolias are my last two genera and mature plants of these are capable of giving displays in the garden, in my opinion, unrivalled by any other genera. Since, however, they form the subject of a special Conference in April, the papers at which will be subsequently published, I do not want here to anticipate these papers. The Camellia season opens in October with the forms of *Camellia sasanqua* followed by *C. oleifera*, if one can obtain the true plant, while *C. saluenensis* and its fine hybrids, the varieties of *C. × Williamsii*, flower freely in the open during mild spells of the Winter. Both these and the numerous varieties of *C. japonica* are completely hardy as plants, although a cold frosty spell will, of course, spoil any open flowers and sometimes a very cold spell early in the Winter seems to affect the buds of *C. japonica*, causing many of them to drop off. This happened at Wisley during the last year although the buds of *C. saluenensis* were undamaged. These Camellias are magnificent plants for the cool greenhouse, as visitors to the Temperate House at Wisley in Winter can testify. They seem never to fail there and every year the fine tree of *C. japonica* var. *magnoliaeflora* is covered in November and December with its almost single pale peach-coloured flowers, waxy and delicate in texture. Another favourite of mine is the big single white variety 'White Swan' while for the pinks and reds 'Chandleri elegans,' 'Lady Clare' a low-growing variety and 'Adolphe Audusson' can be confidently recommended. Later comes the flowering of *C. reticulata* and there are few plants to equal the semi-double variety in floral lusciousness. Flowers 6 inches across are quite common while I believe flowers sometimes reach as much as 9 inches in size. The tree in the Temperate House at Kew is one of the finest I know. It is more tender than *C. japonica*, but very fine plants, flowering abundantly, can be seen outside against walls, both at Bodnant in N. Wales and in Sussex and so it is worth planting in the southern and western counties. The best I have seen are on walls facing south, while a position more northerly or easterly and shaded from the early morning sun is more often recommended for the other Camellias. All these Camellias, with the exception of *C. reticulata*, are easily propagated from cuttings and full directions for this are contained in an article by MR. F. HANGER in the R.H.S. JOURNAL for February, 1947. Another exciting aspect of growing Camellias is the chance that your plants may produce branch sports with flowers of a different colour.

The value of a Temperate House in Winter is very great and I always wonder that redundant and often semi-derelict Peach houses are

not planted up with Winter-flowering shrubs, Camellias, *Tibouchina semi-decandra*, which flowers in royal purple from August to March, Heathers, Epacris, Pelargoniums and the tenderer early-flowering Rhododendrons such as *R. bullatum* and *R. cilicalyx*. They require very little attention for their successful cultivation. I would like to see a revival in the growing of the magnificent Cape Heaths, so many of which were grown in this country a hundred years ago and figured in ANDREW'S magnificent volumes. I have a feeling, although one unconfirmed by experiment as yet, that these plants would succeed with modern methods of electric heating with a thermostat set just to keep out the frost and that the slight drying of the atmosphere in Winter might benefit rather than harm them as long as they were given plenty of moisture when making their new growths after flowering.

It is difficult to resist writing at length about such a magnificent genus as *Magnolia* and its finest members come into our range, flowering in late February, March and the first weeks of April, depending on the weather. I refer to the group which includes *M. Campbelli*, *M. Dawsoniana*, *M. mollicomata* and *M. Sargentiana robusta*, as well as the better known *M. denudata*, although this last is rather an April than a March plant. These large pink-flowering Magnolias are unparalleled, in my view, as flowering trees when they have grown to maturity. Unfortunately this takes some time varying from ten to fifteen years in the case of *M. Sargentiana robusta* to twenty to twenty-five years in the case of *M. Campbelli* while *M. mollicomata* (the eastern equivalent of *M. Campbelli* and a plant very similar to *Campbelli*) and *M. Dawsoniana* seem to flower at periods between the two extremes. They are hardy enough in practically all parts of England but their buds and young growth are susceptible to hard frosts and so they are more suitable for planting in the South and West of England, and the West of Scotland than in the North and East. They should, however, be more widely planted, particularly in parks and other gardens where some continuity of care can be ensured. However, in those years when February and March bring some beautiful warm sunshine, these Magnolias will pay back with abundant measure the lengthy years of their youth and the disappointment of other Springs. Against a blue sky or lit up by a low sun against a darker background of Conifers they look most magnificent. The flowers of *M. Campbelli* are in good forms deep rose-pink on the outside and inside white faintly tinged with pink and 6 to 10 inches in diameter. Imagine a plant with a thousand such flowers, like pink Lotuses or great Water Lilies, outlined against a blue sky. That magnificent plant introduced by G. FORREST under the number F. 25655 and provisionally named *M. mollicomata* 'Lanarth' is a deeper colour than any others of this group and one of the finest flowers I have ever seen. These are not, however, plants for the very small garden as is *Magnolia stellata* which, though a much lesser glory, will flower as a very small plant. I must, however, not encroach too much on the ground of the Conference.

This brief survey has attempted to show what a number of worthwhile and beautiful Winter-flowering plants can be grown but there are many more in addition to those mentioned.

THE BROAD MITE

G. Fox Wilson

ENTOMOLOGIST, R.H.S. LABORATORY, WISLEY.

THE recurrence of an outbreak of the Broad Mite, *Hemitarsonemus latus* (Banks) Ewing, on certain plants in the Temperate House at Wisley during 1949 after the glasshouse had undergone a prolonged period of exposure to DDT vapour by means of a Continuous-Flow Aerosol has called for a review of this little-known pest of glasshouse plants.

The first recorded outbreak of this pest at Wisley occurred in 1929 (6) when an unidentified species of Tarsonemid mite was found attacking the foliage of Aubergine, Begonia, Dahlia, Fuchsia and Tomato. Specimens of the mite were submitted to DR. FLOYD SMITH, who, together with DR. H. E. EWING, both of the United States Department of Agriculture, kindly examined the material and replied (*in litt.*, January 22, 1935), to the effect that it appeared to be *Tarsonemus latus*. Later, EWING (4) confirmed the original identification, and stated that the specimens were the same as the American forms of this species.

HISTORICAL REVIEW

The history of the Broad Mite in the British Isles is briefly outlined as it is of some interest. Confusion had existed for many years as to the organism responsible for a disease of Begonias, often referred to as "Begonia Rust." An early description of this disease by SHEATH (17) suggests that a Tarsonemid mite was primarily responsible for the diseased conditions. W. K. (11) questioned the pathogenic origin of the disease as he had detected numerous white insects (*sic*) barely visible to the naked eye on Begonia leaves. H. W. C. (1) suspected a fungal, not an animal, organism was concerned, especially as Flowers of Sulphur proved effective in controlling an outbreak. It will be noted later that Sulphur dusts provide the most effective control of the Broad Mite. W. W. (23) confirmed the cause of Begonia disease as being due to a Tarsonemid Mite, and that attacks were controlled by the frequent use of tobacco, either in solution or as a fumigant. Infected Begonia leaves were submitted at that time to the late GEORGE MASSEE—the eminent plant pathologist—who confirmed that the so-called Begonia disease was due to very minute, white insects (*sic*), and that any fungal organisms present were secondary parasites. MICHAEL (13, 14), discussed the "Rust Disease" of Begonia, and stated that it was due to a *Tarsonymus* (*sic*).

The first authoritative account of what was undoubtedly an attack of Broad Mite on ornamentals is given by FIELDER (5), who outlined the host range of this species, gave a brief description of the egg, and the habits of the larvae and adults, including what is probably the earliest account of the unique habit of the male mites in carrying about the eggs and females.

NOMENCLATURE

According to EWING (4) and GADD (9), the Broad Mite was originally described by GREEN in 1890 as *Acarus translucens* but, as the name was preoccupied, he republished (1900) under the name *Tarsonymus translucens*. BANKS described a mite in 1904 under the name *Tarsonemus latus*, which was found causing galls on the main shoots of Mango growing in glasshouses in the United States. The species *T. translucens* GREEN was later described and figured by HIRST (10). EWING (4) in his review of the mites belonging to the sub-family *Tarsoneminae* established the synonymy of *A. (T.) translucens* (Green) and *T. latus* (Banks). He erected a new genus *Hemitarsonemus* for *H. tepidariorum* (Warburton)—the Fern Mite—and for *H. latus* (Banks)—the Broad Mite, also known as the Yellow Tea-mite (9). CAMERON (2), in listing the known species of *Tarsonemus*, mentions *T. latus* as causing galls on Mango as described by BANKS, and of attacking Citrus in Cuba.

DISTRIBUTION

The Broad Mite is widely distributed throughout the world being recorded from Europe (Belgium, Denmark, England, Germany, Holland, Switzerland); Asia (India, Ceylon); Africa (Belgian Congo, S. Africa); Australia (N.S.W.); N. and S. America (Brazil); Atlantic Ocean (Bermuda); East Indies (Dutch E. Indies, Phillipines); West Indies (Cuba, Trinidad, Virgin Isles) and N. Pacific (Hawaii).

HOST PLANTS

H. latus has a very wide range of host plants, including glasshouse ornamentals (5, 14, 18, 19), fruit (Citrus), vegetables (Beans, Beetroot, Potatoes), Tea, Cotton, Rubber, Castor Oil (*Ricinus*), Pepper, Tomato, and several other plants.

In connexion with Tarsonemid attack on Potato, MASSEE (12) recorded a severe infestation on this crop growing under glass near Harpenden in May 1942. An earlier record of what was probably this species was made by CARPENTER (3) when he described what he termed was a new disease of Irish Potato in Hawaii. Again, in August 1932, there occurred a suspected case of mite attack on Potato at Ithaca, N.Y., which, later, was confirmed as being due to the Broad Mite, *H. latus* (15, 16).

Attacks of the Broad Mite at Wisley have been confined to glass-house plants, and include :—

<i>Artanema fimbriatum</i>	(i. 1932)	Cyclamen	(vi. 1936)
Aubergine	(v. 1929)	Dahlia	(v. 1929)
Begonia	(viii. 1936)	<i>Exacum affine</i>	(x. 1939)
Browallia	(vi. 1937)	Fuchsia*	(v. 1929)
Capsicum	(v. 1929)	Gerbera	(viii. 1936)
Chrysanthemum	(v. 1929)	<i>Impatiens sultani</i>	(v. 1949)
<i>Clethra arborea</i>	(v. 1949)	Tomato	(vi. 1935)

* There occurred considerable variation in the degree of attack on Fuchsias, and the varieties that exhibited marked susceptibility in July 1936 were:—'Display,' 'Lady Heytonstall,' 'Nautilus,' 'Pasteur' and 'Prince of Wales.'

SYMPTOMS OF ATTACK

Owing to the minute size of the mites, an attack is detected by the grower only from the effect of their feeding on the leaves, especially the younger leaves and/or the flowers.

Signs of attack by the Broad Mite include :—(i) a shiny brittleness of the infested leaves (Fig. 33); (ii) a slight puckering and downward marginal roll of the foliage (Figs. 34 and 36); (iii) an abscission of the buds causing severe bud-drop—specially marked in *Impatiens*; and (iv) a malformation of the blooms of Gerbera (21) and Chrysanthemum, which resembles somewhat that produced by the Tarnished Plant Bug, *Lygus pratensis*. (Text fig. below.)



DESCRIPTION

H. latus has been fully described and figured by EWING (4), GADD (9), HIRST (10), more recently by VAN MARLE (22), and others. The first mentioned author being responsible for the erection of a new genus for this and one other Tarsonemid mite.

The *Egg* is very characteristic, being pearl-coloured, oblong-oval, the lower surface smooth and transparent, and the upper studded with round, whitish tubercles, arranged in 5 or 6 longitudinal rows, about 8 tubercles in the longest row (4, 12). Its length varies from 0.111–0.115 mm., and 0.070–0.076 mm. in width (4, 9).

The *larvae* are 6-legged, and resemble the adult mites in general appearance, but are smaller (0.163 mm. \times 0.085 mm. (4)), and of a light transparent, watery-green.

The *adults* are 8-legged, active, short, broad, milky-white or pearl-coloured with body measurements that vary according to the sex—the

males being 0.146 mm. in length and 0.088 mm. in width, the females 0.224 mm. long and 0.150 mm. wide (4). The fourth pair of legs in this sub-family provide most important taxonomic characters, and variation exists between the sexes and each species. Detailed descriptions of the posterior legs are not discussed other than to state that the male possesses larger, broader appendages than the female (Fig. 35).

LIFE HISTORY AND HABITS

The mites live gregariously chiefly on the underside of the leaves, and favour the young tender expanded foliage upon which to feed. In the case of soft growth (e.g. *Impatiens* and *Exacum*—Fig. 33), the mites swarm over the petioles, buds and tender shoots, but on harder-leaved plants (e.g., *Clethra*), the attack is confined to the distal leaves and the older tougher foliage is ignored. Infestations tend to occur suddenly and the mites spread rapidly to other hosts.

Breeding continues throughout the year, but the rate is more rapid during the period late spring to early autumn when conditions of temperature (65–80° F.) and high atmospheric humidity are favourable. Populations decrease in autumn, and build-up again the following spring.

The Broad Mite can pass through a complete generation in 4–5 days at temperatures of 70–80° F. (19), but the life cycle may vary from 4 days (in high summer) to 7 or more days (in winter).

A curious habit exhibited by this species of Tarsonemid is that of the male mites in carrying the female nymphs to the younger leaves, and thus they play an active part in distributing the pest (9). This habit was observed as early as 1902 (5) when it was stated that the males were seen to carry the eggs and female mites to other leaves. Later observers make it clear that the males are interested only in the female nymphs (9).

The mites will not live in the soil or other material, which makes it unnecessary to fumigate or disinfect the benches, glasshouses, etc. (20).

SPREAD OF THE MITES

This pest is disseminated in a variety of ways, including the method already described whereby the males transport the quiescent female nymphs. Those who handle infested plants during potting, disbudding and cleaning operations may be responsible for carrying the mites and, owing to the microscopic nature of these Tarsonemids, it is difficult for the grower fully to appreciate the importance of taking precautions to avoid such contaminations. The mites readily drop off the plants when there is any movement that shakes the foliage, and thus fresh focal points of attack occur when infested plants are moved carelessly from one place to another.

The mites are liable to be spread by other pests—Aphides and Thrips in particular—to the bodies of which they have been found attached (20).

Natural spread can occur when adjacent plants are in contact. It was found, however, that while the Cyclamen Mite (*Tarsonemus pallidus*) is deterred by separating plants so that the foliage does not overlap, a space of 18 inches between infested and clean plants did not prevent the spread of the Broad Mite (19, 20).

Routine syringing of the infested plants may aid in disseminating the mites, and especially the Cyclamen Mite (20).

Wind may serve as a factor in spreading the pest, both in the open on such crops as tea (9), and under glass where strong currents of air blow on to infested plants through an open side ventilator.

CONTROL MEASURES

(1) *Cultural Practices* play an important role in checking outbreaks of this mite. It is essential, therefore, to take care when potting, dis-budding and handling infested plants to avoid disseminating the pest by careless methods. The fact that the mites tend to drop readily from plants when there is any disturbance makes it necessary to avoid spreading them in this way, and to take measures to control the outbreak before any such movement is contemplated. Routine fumigation of glasshouses is desirable to control such pests as Aphides and Thrips, both of which may serve as carriers of the mites. Normal spacing of plants to prevent natural spread of the Broad Mite is less important than in the case of the Cyclamen Mite.

(2) *Chemical Control* includes (i) *Dusting*, which provides a more effective control of the Broad Mite than spraying or fumigating, and 2-3 applications of Sulphur, preferably finely divided Sulphur dust, will result in the complete eradication of the pest. The mites are readily killed within an hour at glasshouse temperatures of 65° F. and higher, but the eggs and pre-adult nymphal stages are only slightly affected. However, the larvae and adults that emerge from these stages are killed provided the dust is still present on the foliage and has not been removed by syringing (21). All infestations of this pest at Wisley have been readily and completely controlled by timely applications of finely ground Flowers of Sulphur. The Broad Mite appears to be the most intolerant of Tarsonemids in its larval and adult stages to Sulphur.

CARPENTER (3) is stated to be the first to use Sulphur dust against what was probably this mite during 1918 in Hawaii, but an earlier record in 1895 is that of H. W. C. (3). who, despite his disbelief that "Begonia disease" was associated with any pest, stated that Flowers of Sulphur was effective in controlling an outbreak.

(ii) *Spraying* with Nicotine was advocated by the earlier workers (5, 14, 23). The original outbreak of this pest at Wisley in 1929 was partially controlled with a refined Petroleum oil emulsion. It was found, however, that some varieties of Fuchsia were intolerant of "White Oil" and partial defoliation resulted on such species as *F. corymbifolia*, *Colensoi* and *magellanica* within a few days of applying a 2 per cent. emulsion. While the concentration was reduced to 1 per cent. in January 1931 to control another outbreak of this pest, serious defoliation occurred on the *fulgens* type of Fuchsia, being specially marked in the case of the varieties 'T. Bonstedt' and 'Thalia.'

Owing to the effective control following the application of Sulphur dusts and to the danger of phytotoxicity from oil emulsions, the latter cannot be recommended as a reliable acaricide on tender ornamentals.

(iii) *Fumigation* with Calcium cyanide, Naphthalene and Methyl bromide provides a control of this mite, but DDT vapour from a

Continuous-Flow Aerosol had no effect upon any stages of the Broad Mite when operated over a period of three months in the Temperate House at Wisley during 1949.

SMITH (19, 20) was able to control the pest with Calcium cyanide at dosages of 1 oz. per 1,000 cu. ft. of space but, since this dosage may produce phytotoxicity in a house of mixed ornamentals, its use is not recommended.

Naphthalene was used by SMITH (*loc. cit.*) at the rate of 2 oz. per 1,000 cu. ft. of space, the effects of which was to kill the mite in all its stages with the exception of the eggs, only 74 per cent. of which were killed.

Methyl bromide is advocated by VAN MARLE (22), who suggests that Begonias may be cleared of this pest by using this fumigant at the rate of 1 oz. per 50 cu. ft. of space for 6 hours at 59–62° F. The highly toxic nature of this gas makes it inadvisable to recommend its use in glass-houses in this country.

(3) *Physical Control*, including heat treatments of infested plants with warm-water (15 mins. immersion at 110° F.) or with vapour heat (30 mins. exposure at 100° F.) has been recommended by SMITH (19, 20, 21), but such treatments are advocated chiefly against attacks of the Cyclamen mite on certain ornamentals, including Gerberas.

ACKNOWLEDGMENTS

The author expresses his sincere thanks to DR. H. E. EWING for kindly identifying the material submitted to him, and to DR. FLOYD F. SMITH, also of the U.S. Department of Agriculture, Washington, for sending his publications relating to this and other Tarsonemid mites, for kindly suggesting the species of mite concerned originally in the Wisley outbreaks, and for measures for its control. Due acknowledgment is made to the author's colleagues, MR. F. C. BROWN, for the photographs illustrating this article, and MISS JOYCE MAYNARD for the line drawing.

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NEW AND NOTEWORTHY PLANTS

Nymphaea gigantea alba

IN *Flora Australiensis* BENTHAM and MUELLER describe the flowers of *Nymphaea gigantea* as "blue, purple, pink and rarely white." While the purple and pink forms are now known to belong to the closely allied species *Nymphaea violacea*, I have felt that the inclusion of the white-flowered form of the blue *N. gigantea* would be a welcome addition to the collection of tropical Water-Lilies at the Royal Botanic Gardens, Kew.

In March, 1939, MR. C. T. WHITE, the Queensland Government botanist, visited Kew, bringing with him a number of pressed plants for the Herbarium. Among the collection were specimens of Australian Water-Lilies which I was invited to identify. I at once recognized the white form of *N. gigantea*, and asked MR. WHITE if he would collect seed. This he kindly consented to do.

On the outbreak of war MR. WHITE returned to Australia, but as his war-time duties took him to New Guinea and the British Solomons, I gave up hope of getting seed for some years. In June, 1945, shortly before the end of hostilities in the Far East, MR. WHITE wrote from Brisbane saying he had several times unsuccessfully tried to get seed and giving me the address, in Queensland, of MR. ALBERT DE LESTANG, a collector whom he thought might be able to help.

No time was lost in writing MR. DE LESTANG, who replied that, although he had not seen the plant for two years, he would contact the roving aborigines and try and get them to collect seed. This is by no means a simple operation, since Water-Lily seed pods sink beneath the surface of the water to ripen, and the presence of crocodiles adds to the hazards.

A later letter informed me that he had contacted the natives and, after filling their tucker bags, persuaded them to go in search of the plants and collect seed.

Eventually the natives returned, and in January, 1946, MR. DELESTANG sent me seed and expressed the fervent hope that the natives had not tricked us. Unfortunately the seed did not arrive until the 17th April. It was then too late to raise plants at Kew during our short summer season, so I sent seed to MR. GEORGE H. PRING, Superintendent of the Missouri Botanical Garden, U.S.A., who, in addition to being one of the world's foremost authorities on Orchids, is also famous for his outstanding success in breeding tropical Water-Lilies.

Owing to the lateness of the season MR. PRING sent some of the seed to MR. ALFRED J. PROEBSTLE, at Brazoria, Texas, where in a pool fed from a warm artesian well, tropical Water-Lilies are grown all the year round. MR. PROEBSTLE succeeded in raising plants although they are the most difficult of all tropical Water-Lilies to raise, owing to their habit of going to "sleep" when there is a check in their growth.

In October, MR. PRING made a special visit to Texas to see the plants in flower, and has written a most interesting description of his visit in the *Missouri Botanical Garden Bulletin* for February, 1947.

Last year MR. PRING sent tubers to Kew, and now this magnificent Water-Lily, its white scented flowers freely produced and measuring six inches in diameter, makes its appearance at Kew for the first time in cultivation in Europe, nearly one hundred years after the introduction, in 1852, also at Kew, of the lovely *Nymphaea gigantea*.

The photographs show *N. gigantea forma alba* with flowers ten inches in diameter growing in the open at the Missouri Botanical Garden at St. Louis (Figs. 37 and 38).

R. S. TRICKETT

AWARD OF GARDEN MERIT—LXXXIII

392 CAMELLIA WILLIAMSII VAR. J. C. WILLIAMS

Award of Garden Merit May 30, 1949

THIS excellent Camellia was raised by the late MR. J. C. WILLIAMS of Caerhays Castle in Cornwall from a cross between *C. saluenensis* and a variety of *C. japonica*. It is very fully described and discussed by SIR WILLIAM WRIGHT SMITH, F.R.S., and LORD ABERCONWAY in the R.H.S. JOURNAL LXXIV, Part 8, p. 346. An illustration in colour is also given. It was awarded the F.C.C. on March 17, 1942. The flowers are pale blush pink, single with a fine mass of yellow stamens in the centre and 3 inches across. They are borne very freely and over a long period on quite young plants. LORD ABERCONWAY in the article quoted above referred to it as "one of the best shrubs that has ever been introduced to our gardens."

393 CYTISUS NIGRICANS

Award of Garden Merit, October 19, 1948

This is one of the most valuable of the later flowering Brooms; the flowers are bright yellow and are generally borne very freely on rather elongated terminal racemes over a long period in July and August when there is not an over abundance of good flowering shrubs. It should be planted in a sunny position and should be pruned strongly in spring so as to encourage the growth of young shoots on which the flowers appear. The individual flowers are small but are borne with such freedom that a group of this Broom makes an effective feature in the garden. A sunny position should be chosen if possible for this plant. *Cytisus nigricans* is a native of Central and Southern Europe and was figured in the *Botanical Magazine* (t. 8479).

394 DAPHNE TANGUTICA

Award of Garden Merit, July 26, 1949

This Daphne forms a tight and low-growing evergreen shrub in the garden, seldom reaching more than two feet in height. The flowers are fragrant, rosy-purple outside, about half-an-inch across and white inside stained purple towards the tips and are borne freely even on small

plants. This species is very closely related to *Daphne retusa* and was regarded by MR. BEAN as synonymous with that species. It has, however, been retained by REHDER as a separate species, the thick leathery leaves being longer and narrower in proportion to their length and the slightly smaller clusters of flowers showing more purple colouring. It is a native of N.W. China and was originally discovered by the Russian traveller PRZEWALSKI in 1873. It was, however, not introduced to cultivation till 1914 when it was recollected by REGINALD FARRER. In this country it flowers during April and May and was figured in the *Botanical Magazine* (t. 8855). Like other members of this genus mature plants are intolerant of moving and it should be planted out, preferably from a pot, when young. It appears to be perfectly hardy.

395 DICTAMNUS ALBUS VAR. RUBER

Award of Garden Merit, October 17, 1949

This herbaceous plant has been grown in England under the name of *Dictamnus Fraxinella* for a very long time and is a native of Southern Europe. It is widely known as the 'Burning Bush' from the highly aromatic leaves which give off an ethereal oil. On a very still and very warm day it is possible to ignite this. The leaves are pinnate and rather thick in texture. The flowers of this *Dictamnus* are pink and the plant makes a thick clump with flower spikes two feet in height in a sunny border. It is now generally regarded as a variety of the white flowering *Dictamnus albus*, which is a very polymorphic Linnean species widely distributed across Southern and Central Europe, Central Asia, China and ranging from Spain to Manchuria and Korea. *Dictamnus* belongs to the Rutaceae. Another pink-flowering variety *D. albus* var. *caucasicus* was featured in the *Botanical Magazine* (t. 8961) and this is probably the finest garden variety but is still rare in cultivation.

396 HALESIA CAROLINA

Award of Garden Merit, June 17, 1946

This is the commonest species of Snowdrop tree to be found in English gardens. It is a deciduous tree and reaches a height of twenty to thirty feet in this country. It is very quick growing and flowers as quite a small tree. The flowers are white, bell-shaped and pendulous, being borne in clusters of three to five from the joints of the young wood of the previous year early in May. It is a native of the south-eastern United States and being perfectly hardy in this country, it should be seen more frequently than it is. *Halesia carolina* is very closely allied to *H. monticola*, but makes a rather more spreading, less upright tree. *Halesias* thrive best in a rather moist but not waterlogged position and make excellent small trees for the open woodland garden. They are not suitable for lime soils. Little pruning is required. The genus was named after DR. STEPHEN HALES, the distinguished botanist and physiologist who died in 1761. It was figured in the *Botanical Magazine* (t. 910) under the name of *H. tetraptera*, which is now regarded as a synonym.

397 KALMIA LATIFOLIA

Award of Garden Merit, October 19, 1948

This fine evergreen shrub, known widely in N. America as the "Mountain Laurel," is a member of the Ericaceae and enjoys similar conditions to Rhododendrons. It is a native of Eastern N. America and MR. BEAN describes it as "probably the most beautiful evergreen shrub obtained from that region." The flowers of different forms vary in colour from pale blush pink to deep rose, almost crimson and are borne freely in closely aggregated terminal clusters. The corollas are an inch in diameter and are saucer-shaped when they open revealing deeper purple markings and brown anthers within. The leaves are slightly leathery and have a rich glossy texture and surface which adds greatly to the attraction of the plant. It is an excellent shrub for the slightly damp, although not waterlogged woodland garden and is perfectly hardy, flowering in May and June. Kalmias are rather slow growing at first but will in time make large bushes or even small trees up to ten feet in height. This species has been cultivated for a long time in this country and in addition to the name "Mountain Laurel" derived from the appearance of its foliage, it has been known as the "Calico-bush" from the pink flowers. It was featured in the *Botanical Magazine* (t. 175).

WISLEY TRIALS, 1949

CHRYSANTHEMUMS, KOREAN AND RUBELLUM
VARIETIES, AT WISLEY, 1949

Fifty-five varieties of Korean Chrysanthemums and *Chrysanthemum rubellum* were grown at Wisley for trial during 1949. The stocks of the varieties were given the warm-water treatment—110° F. for 30 minutes—as a precaution against Eelworm attack.

The rooted cuttings, three of each variety, were planted on May 9, 1949. The plants were allowed to grow naturally, no disbudding being done. The report indicates the present state of the trial, showing those deleted from the trial. The trial was judged by a sub-Committee of Floral "A," on September 27, and October 25, 1949, who made their recommendations for Awards as given below. The number in brackets following the variety is that under which it was grown in the trials.

FLOWERS WHITE OR NEARLY SO

The following varieties have been deleted from the trial: QUEEN CUSHION (1), WEDDING DAY (10).

FLOWERS OF YELLOW SHADES

The following varieties have been deleted from the trial: GOLDEN ARROW (12) GOLDEN FRAGRANCE (16), MARY STOKER (18).

FLOWERS OF ORANGE-BRONZE SHADES

Bracken (raised by Mrs. O. Murrell, introduced and sent by The Orpington Nurseries Co., Ltd., Orpington, Kent). H.C. October 25, 1949.—4½ feet tall, of erect habit; flowers single, 2½ inches diameter, Spanish Orange (H.C.C. 010) tinted at base of petals Burnt Orange (H.C.C. 014). Flowering from October 18. (22).

Old Golden (raised by Mrs. O. Murrell, introduced and sent by The Orpington Nurseries Co., Ltd., Orpington, Kent). **H.C.** October 25, 1949.—4 feet tall, of bushy habit; flowers single, $2\frac{1}{2}$ inches diameter, Mars Orange (H.C.C. 013) shaded deep coppery bronze. Flowering from October 18. (23).

FLOWERS REDDISH-BRONZE

Polly Flinders (raised by Mrs. O. Murrell, introduced and sent by The Orpington Nurseries Co., Ltd., Orpington, Kent). **A.M.** September 27, 1949.—Plant 2 feet, of compact, bushy habit; flowers single, 2 inches diameter, Jasper Red (H.C.C. 018) shaded to Brick Red (H.C.C. 016). Flowering from September 1. (26).

FLOWERS OF PINK SHADES

Azaleanum (sent by Perry's Hardy Plant Farm, Enfield, Middlesex). **A.M.** September 27, 1949.—Plant 12 inches tall, of compact, bushy habit; flowers semi-double, 2 inches diameter, white flushed Amaranth Rose (H.C.C. 530/1). Flowering from August 5. (2).

The following varieties have been deleted from the trial: JERVIS BAY (28), MOIRA GODDARD (29), PHILLIPINE GREEN (30).

FLOWERS OF ROSE-PINK SHADES

The following varieties have been deleted from the trial: FRIDA (32), SOLFERIGNO (33), SPITFIRE (34).

FLOWERS OF SALMON-CORAL SHADES

Francis (raised by Mr. G. Murray, introduced and sent by Burleydam Nurseries (Chester), Ltd., Little Sutton, Wirral, Cheshire). **H.C.** October 25, 1949.—3 feet tall, bushy, compact habit; flowers semi-double, $2\frac{1}{2}$ inches diameter, Peach (H.C.C. 512) flushed with Chinese Coral (H.C.C. 614/1) and Shell Pink (H.C.C. 516) with a trace of Coral Pink (H.C.C. 0619/2). Flowering from September 25. (39).

The following varieties have been deleted from the trial: ANNE, LADY BROCKET (36), PEACH PINK (37), PRINCESS MARGARET (38).

FLOWERS OF ORANGE-BRONZE SHADES

Betty Ross (raised by Mr. G. Murray, introduced and sent by Burleydam Nurseries (Chester), Ltd., Little Sutton, Wirral, Cheshire). **H.C.** October 25, 1949.—3 feet tall, of compact, bushy habit; flowers semi-double, $2\frac{1}{2}$ inches diameter, Apricot (H.C.C. 609/1) shaded Saturn Red (H.C.C. 13/1). Flowering from October 5. (44).

The following variety has been deleted from the trial: COPPER ROSE (42).

FLOWERS CARMINE-ROSE

The following variety has been deleted from the trial: FUCHSINE (47).

FLOWERS OF CHERRY-RED SHADES

Aladdin's Lamp (raised by Mrs. C. Murrell, introduced and sent by The Orpington Nurseries Co., Ltd., Orpington, Kent). **A.M.** October 25, 1949.— $1\frac{1}{2}$ feet tall, of compact, bushy habit; flowers semi-double, $2\frac{1}{2}$ inches diameter, Claret Rose (H.C.C. 021) flushed with Jasper Red (H.C.C. 018). Flowering from September 1. (7).

Derby Day (raised by Mrs. O. Murrell, introduced and sent by The Orpington Nurseries Co., Ltd., Orpington, Kent). **H.C.** October 25, 1949.— $3\frac{1}{2}$ feet, erect habit; flowers mostly semi-double, a few double, $2\frac{1}{2}$ inches diameter, China Rose (H.C.C. 024) flushed with Spirea Red (H.C.C. 025). Flowering from October 18. (49).

FLOWERS OF RED SHADES

Caliph (raised and introduced by The Bristol Nurseries, U.S.A., and sent by The Orpington Nurseries, Co., Ltd., Orpington, Kent). **A.M.** October 25, 1949.—Described **R.H.S. JOURNAL**, 74, p. 358. **H.C.** 1948. (52).

Flame (raised by Mrs. O. Murrell, introduced and sent by The Orpington Nurseries Co., Ltd., Orpington, Kent). **H.C.** October 25, 1949.—4½ feet tall, of erect habit; flowers single, held on stiff, rather stout stems, 2½ inches diameter, a shade between Blood Red (**H.C.C.** 820) and Currant Red (**H.C.C.** 821) with a Chestnut-red flush. Flowering from October 15. (54).

The following varieties have been deleted from the trial: **CHERRY RED** (53), **OPORTO** (55).

BOOK NOTES

"Rhododendrons." By F. Kingdon-Ward. 128 pp. Illus. (Latimer House Ltd.) 7s. 6d.

Captain F. Kingdon-Ward's new book on *Rhododendrons* will be heartily welcomed and may confidently be expected to enlarge the vogue for this already popular genus. It can be said with truth that no one living knows more about Rhododendrons as they grow in their natural habitats than Kingdon-Ward, for he has spent over thirty years plant hunting in the mountains of Burma, Yunnan, Tibet, Assam and the eastern Himalayas.

It is claimed that the book, no more than pocket size, includes all the essential information that the amateur grower needs to know; and it will be agreed that this claim is no exaggerated one; indeed, the amateur, apt to be overwhelmed with so much richness, might wish that the choice of species had been even more selective.

Separate chapters are devoted to Rhododendrons as trees, as shrubs, dwarf Rhododendrons, Azaleas, greenhouse Rhododendrons and to Choice of Species; another chapter is concerned with hybrids; others, of much interest, deal with cultivation and propagation.

Here and there are remarks which some might dispute, such as that "The name Azalea was originally given to the deciduous Rhododendrons"; and as to the selected lists, well, no two connoisseurs are likely to hold the same views and we may readily grant that Ward's are excellent.

It is on one point that I would venture seriously to disagree with him—his proposed classification. Ward has joined the school of those who would split the genus into several genera. But, though I claim that far more can be said against than in favour of such procedure with regard to Rhododendrons, it is not so much about this that I would wish to argue as about the scope and substance of his proposed four genera; and I would banish for ever his three new, undesirable and inelegant names, which fortunately are likely to be forgotten for they fail to be "validly published." Why use such terminology? Why be at variance with nature whose natural associations are quite otherwise? Why so disparage consensus of opinion and disagree so fundamentally with every botanist from G. Don to Copeland? Why the unspeakable *Anthopogodendron* for G. Don's *Pogonanthum*? Why the horrible, hideous, hybridous *Falconodendron* for a comparatively insignificant association?

But as Ward states, "The owner of a small garden who wishes to cultivate a few Rhododendrons is not much concerned with how the thousand odd species of the genus are classified", and will therefore not pay much attention to this chapter.

The rest of the book is admirable.

J. MACQUEEN COWAN

"The Clove Tree." By G. E. Tidbury. Demy 8vo. 212 pp. Illus. (Crosby, Lockwood.) 18s.

The author is an agricultural officer in the Protectorate of Zanzibar, and this book appears to be, as the publishers describe it, "a comprehensive account of the history of the Clove tree, its cultivation, trade and products," and it should be helpful to all growers of Cloves and also to that wider public who like to know how their foods and spices reach their table.

Probably few realise that the Cloves are really dried unopened buds of a member of the Myrtle family. His first chapter on the history of the Clove trade is particularly interesting.

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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXXV



Part 3

March 1950

THE SECRETARY'S PAGE ANNOUNCEMENTS—MARCH AND APRIL

Shows, Lectures and Meetings

TUESDAY, MARCH 7. 12 NOON TO 6 P.M. First day of Show.
3 P.M. LECTURE: *Cool Greenhouse Orchids and Methods of Cultivation for the Week-end and Evening Gardener* by MR. D. F. SANDER.

WEDNESDAY, MARCH 8. 10 A.M. TO 5 P.M. Second day of Show.

TUESDAY, MARCH 21. 12 NOON TO 6 P.M. First day of Show.
Daffodil Competition.
McBean Memorial Trophy Competition for Cymbidiums.
Alpine Garden Society's Competition.
3 P.M. LECTURE: *Rock Garden Plants* by MR. W. G. MACKENZIE.

WEDNESDAY, MARCH 22. 10 A.M. TO 5 P.M. Second day of Show.

TUESDAY, APRIL 4. 12 NOON TO 7 P.M. First day of Show.
Camellia and Magnolia Competition.
2.30 P.M. First day of Camellia and Magnolia Conference.

WEDNESDAY, APRIL 5. 10 A.M. TO 5 P.M. Second day of Show.
10.30 A.M. } Second day of Camellia and Magnolia Conference.
2.30 P.M. }

THURSDAY, APRIL 13. 12.30 P.M. TO 7 P.M. First day of Daffodil Show.
First day of British National Carnation Society's Spring Show.
3 P.M. LECTURE: *Points of a Good Daffodil and how to stage Daffodils for Exhibition* by MAJOR C. B. HABERSHON.

Shows, Lectures and Meetings—cont.

FRIDAY, APRIL 14. 10 A.M. TO 5 P.M. Second day of Daffodil Show.

Second day of British National Carnation Society's Spring Show.

TUESDAY, APRIL 18. 12 NOON TO 7 P.M. First day of Show. Sewell Medal Competition for Alpines for Amateurs.

3 P.M. LECTURE: *Architecture in Relation to Gardens* by MR. G. P. YOUNGMAN, A.I.L.A., A.M.T.P.I.

WEDNESDAY, APRIL 19. 10 A.M. TO 5 P.M. Second day of Show.

TUESDAY, APRIL 25. 12 NOON TO 7 P.M. | Alpine Garden

WEDNESDAY, APRIL 26. 10 A.M. TO 5 P.M. | Society's Show.

Demonstrations at Wisley—The following demonstrations will be given at Wisley, that on the second day being a repetition of the demonstration given on the first:—

Flower Garden

March 8, 9. Pruning of Roses and Shrubs. (2-4 P.M.)

March 15, 16. Seed Sowing and Vegetative Propagation of Alpines (2-4 P.M.)

Fruit Garden

March 22, 23. Spring Spraying of Fruit Trees. (2-4 P.M.)

Opening of Shows—The Council has decided that as an experiment during the period of summer time this year the Society's Shows shall remain open on the first day of each Fortnightly Show until 7 P.M. This is to give an opportunity of seeing the Show to those Fellows and others living in London who cannot get away from their offices in time to see the Show before 6 P.M. This experiment will be carefully watched to see whether the response is sufficient to justify the same arrangement in future years.

Publications—*New Plants of the Year* 1949 will be ready early in March. This contains descriptions of all plants which received awards at Vincent Square or after trial at Wisley during 1949 and is illustrated both in colour and in monochrome. It is thought that this volume should be of special value to overseas Fellows and those who are not able to visit the Shows. It may be obtained on application to the Secretary, price 12s. 6d. plus postage and packing 9d. There are still copies available of *New Plants of the Year* 1948 and copies of this can be supplied together with the 1949 volume at the inclusive price of £1, postage 1s.

CAMELLIA AND MAGNOLIA CONFERENCE, 1950

THIS Conference will be held in the Lecture Room of the Society's New Hall, Greycoat Street, Westminster, on April 4 and 5, 1950. On each of these days experts will give papers in the Lecture Room, particulars of which are given below. A two-day Show will be held concurrently with the Conference at which displays of Camellias and Magnolias will be a special feature. The Conference will be organized on the same lines as the Rhododendron Conference and it is hoped that it may be attended by enthusiasts on Camellias and Magnolias from all over the world.

On March 31 and April 1 there will be day-excursions to outstanding gardens in the vicinity of London where there are collections of these two genera. A six-day tour by motor-coach has also been arranged, starting March 21, visiting Cornish gardens renowned for their collections of Camellias and Magnolias. The party will proceed by train to Falmouth.

The following programme has been arranged and further particulars may be obtained on application to the Secretary. Early application for places on the tours is necessary.

PAPERS TO BE GIVEN AT THE CONFERENCE

Tuesday, April 4, 1950

Chairman

The President of the Royal Horticultural Society

2.30 P.M. "Camellias in Cornish Gardens": a film with commentary by MR. G. H. JOHNSTONE, O.B.E., and DR. W. L. STEWART.

"The varieties of *Camellia reticulata* in Yunnan" by MR. T. T. YÜ (A brief summary only with lantern slides will be given.)

followed by—

"Forms of *Camellia japonica*" by DR. H. HAROLD HUME, (President-Emeritus of the American Camellia Society).

Wednesday, April 5, 1950

10.30 A.M. "Propagation of Camellias and Magnolias" by MR. H. G. HILLIER.

followed by—

"Survey of the Genus *Magnolia* together with *Michelia* and *Manglietia*" by MR. J. E. DANDY, M.A., F.L.S. (Department of Botany, British Museum (Natural History)).

2.30 P.M. "Chinese Magnolias in Cultivation" by MR. G. H. JOHNSTONE, O.B.E.

followed by—

"Camellia Species" by MR. J. R. SEALY, B.Sc., F.L.S. (Royal Botanic Gardens, Kew).

DAY EXCURSIONS

- Friday,
March 31, 1950 Visit to Tittenhurst, Sunninghill (property of MRS. D. MOSENTHAL), to the Royal Horticultural Society's Gardens, Wisley, and to the Royal Botanic Gardens, Kew.
- Saturday,
April 1, 1950 Visit to Nymans, Handcross (property of LIEUT.-COL. L. C. R. MESSEL, O.B.E., F.L.S., V.M.H.), and to Borde Hill, Haywards Heath (property of COL. R. S. CLARKE, M.P.).

SIX-DAY TOUR BY MOTOR COACH
VISITING CORNISH GARDENS RENOWNED FOR THEIR
COLLECTIONS OF CAMELLIAS AND MAGNOLIAS

- Saturday,
March 25 London—Falmouth (train.)
- Sunday, March 26 Visit to Trewithen, Grampond Road (property of G. H. JOHNSTONE, ESQ., O.B.E.) and to Scorrier House, Scorrier (property of MRS. F. WILLIAMS).
- Monday, March 27 Visit to Tregothnan, Truro (property of Viscount FALMOUTH) and to Heligan, St Austell (property of CMDR. H. H. THOMAS).
- Tuesday, March 28 Visit to the Truro Flower Show and to Caerhays Castle, Gorran (property of CHARLES WILLIAMS, ESQ., M.P.).
- Wednesday,
March 29. Visit to Lanarth, St Keverne (property of M. P. WILLIAMS, ESQ., M.B.E.), to Trewidden, Buryas Bridge, Penzance (property of MRS. CHARLES WILLIAMS), and to Trengwainton, PENZANCE (property of COL. E. H. W. BOLITHO, D.S.O.).
- Thursday,
March 30 Return to London (train).

The inclusive charge for this tour will be £18 6s. 6d.

This Tour has been planned in order to supply information to those actively engaged in the study or raising of Camellias and Magnolias and will necessarily be concentrated and therefore strenuous. Owing to the limited number of places, the Council of the Society reserves the right to use its discretion in the allocation of vacancies, and Fellows are asked to abide by the Council's decision.

All arrangements for the Tour have been placed in the hands of MESSRS. THOS. COOK & SON, to whom applications will be forwarded in due course, and with whom all correspondence regarding details of the Tour should be conducted.

WISLEY IN MARCH

EARLY in the year it is the bulbous plants which are outstanding, providing a welcome display of colour in the garden. Their carefully stored food supply and already-formed flower buds give them an advantage over their fellows. Down the old Apple walk which runs parallel to the herbaceous borders is stretched a multicoloured ribbon of orange, purple and white Dutch Crocuses. They have been established here for many years, never failing to produce a wealth of bold satiny flowers. Among many others, 'The Bishop' and 'Gladstone' are two popular purple varieties, while 'Striped Beauty' has ashy grey flowers overlaid with mauve. Bordering the gravel path *Bergenia cordifolia*, once known as *Saxifraga cordifolia*, is throwing up dense pink flower-heads above the fleshy green leaves.

Entering Seven Acres the border on the right of the path is densely carpeted with the brilliant sky-blue stars of *Chionodoxa Luciliae*. Scattered throughout the borders are vivid patches of yellow created by the Forsythias. *F. ovata* is the earliest to flower and only grows to about 4 feet in height. Following this Korean species come *F. Giraladiana*, *F. suspensa* and *F. intermedia* var. *spectabilis*. To keep them in a free-flowering condition some of the old wood should be pruned away each year directly after flowering. In the border on the north-west side of Seven Acres, backing on the river, there is a shapely plant of *Osmanthus Delavayi* with small white, sweetly scented flowers.

The Heath Garden is becoming steadily more colourful as the varieties of *Erica carnea* come more strongly into bloom. There are numerous named varieties such as 'Thomas Kingscote,' 'Winter Beauty' and 'Pink Beauty', all of varying shades of pink.

In the Wild Garden three species of the evergreen shrubby genus *Pieris* will be flowering late in the month, *P. floribunda* from North America, *P. taiwanensis* from Formosa and *P. japonica*; all three bear panicles of white urceolate flowers. Sheets of golden yellow are quickly being spread under the trees and along the ditches as the flowers of *Narcissus cyclamineus* again paint one of the pictures for which Wisley is famed. On the south side of the glade and elsewhere are a number of large old plants of varieties of *Camellia japonica*, single and double, in shades of pink, crimson and white.

At the end of this month and the beginning of April a conference on Camellias and Magnolias is being organized by the Society in connection with which, on March 31, a visit will be paid to the Gardens; a note on these plants may therefore be of interest.

In the middle of the nineteenth century, Camellias were perhaps the most popular greenhouse plants in this country, the form of the old varieties being well illustrated by the coloured plates in CHANDLER AND BOOTH's *Monograph* published in 1831. At the turn of the century their popularity rapidly declined, but now interest is again being taken in them, this time as spring-flowering shrubs to be grown in the open against a wall or under the shade of trees. *C. japonica* was the first of the genus to be introduced, being cultivated in 1739 by ROBERT JAMES, LORD PETRE as a stove plant. It was from this species that all the English-raised varieties were derived in the early days. Some few years ago it

was crossed with *C. saluenensis*, a plant introduced from mid-west Yunnan by FORREST in 1917, the group of hybrids from this cross being named *C. × Williamsii* (see R.H.S. JOURNAL, vol. LXXIV, 346 (1949)) in honour of their raiser, MR. J. C. WILLIAMS. Several varieties have been separated, the most notable being 'J. C. Williams' itself and the darker pink 'Mary Christian.' Visitors can see these varieties flowering on Battleston Hill. Another species of real garden value is *C. reticulata*. The wild form was introduced from Yunnan by FORREST, but it has been represented in England ever since 1820 by a double-flowered form from Chinese gardens which was introduced by CAPTAIN RAWES of the East India Company. Many other varieties are cultivated in Yunnan, where it is the "national" flower, and efforts are now being made to introduce a selection of these to American and British gardens.

In the Magnolias we have some really first-class garden plants, the only disadvantage being the length of time many of them need before they will flower. *M. stellata* is the exception, flowering when only a few feet high. Growing slowly at first, but eventually making a small tree, it is a native of Japan, abounding in the woods on Mount Fujiyama. There are several specimens in the Gardens which should be flowering later this month, one of them being planted in the dell on Battleston Hill. On Weather Hill a shapely tree of *M. Kobus* will also be flowering. Nearby is the variety *borealis*, which is larger and hardier than the type but does not reach flowering condition so soon. In April *M. × Soulangiana* will begin to bloom. This plant, and its numerous varieties, is probably the most popular. The original hybrid was raised in the garden of Chevalier Soulangue Bodin, an officer of the French Army, at Fromont near Paris, *M. denudata* being fertilized with pollen from *M. liliflora*.

On the Rock Garden are patches of Snowdrops and Snowflakes and several Primulas, such as *P. rosea*, *P. elatior* and *P. frondosa*. The dark green leaves of the truly carpeting *Saxifraga oppositifolia* are studded with stemless mauve flowers. It is planted here at the head of the scree, while in the moist soil on the edge of the highest pond the double variety of the Marsh Marigold flourishes. To the left of the steps to the Alpine House grows a beautiful plant of similar colouring, *Erythronium tuolummense*, with flowers like a miniature Turk's Cap Lily.

In the beds outside the Alpine House the collection of hybrids and varieties of Waterlily Tulips, *T. Kaufmanniana*, open their colourful, almost stemless flowers in the sun.

Walking along the path in the direction of the Alpine Meadow one passes the bi-generic hybrid \times *Chionoscilla Allenii* on the very fringe of the meadow. The meadow itself is scattered with thousands of Hoop-Petticoat Daffodils, one of the finest spring displays in the Gardens. The path now runs along the edge of the Wild Garden where the Dog's Tooth Violet flourishes along with *Chionodoxas* on a dry mound to the left of the path.

In the Temperate House the plants in flower will be little different from those mentioned last month beyond the addition of such Rhododendrons as *R. inaequale*, *R. ciliicalyx* and *R. bullatum*.

NOTES ON A FEW PLANTS FROM S.E. TIBET

George Taylor, D.Sc.

THE tract of the Himalaya which thrusts into the bend of the Tsangpo is the home of many very lovely plants, and of these the members of the genus *Primula* are specially noteworthy. It is unfortunate, however, that so many of them are tantalizingly obdurate in their refusal to accept this country as a home. In this category are four representatives of the *Amethystina* section which LUDLOW, SHERRIFF and I collected in 1938—*P. Dickieana*, *P. Kingii*, *P. odontica* and *P. Valentiniana*—and which are surely amongst the most attractive of plants. Their usual transitory appearances in gardens in this country have given a very inadequate idea of their loveliness. They are all species apparently exacting in their requirements, for they enjoy continuous rain or constant mist baths for several weeks during the growing season and are wrapped in a deep blanket of snow in the winter. It would be difficult to reproduce such conditions in this country, and, were it possible, there are probably other factors to be resolved before the plants could be acclimatized. Certainly there is scope for research to discover the needs of these plants, but material for experiment is unfortunately very scarce and they will probably continue to frustrate gardeners by their capriciousness.

The three species *P. Kingii*, *P. odontica* and *P. Valentiniana* are closely related. All are gregarious, of neat habit and with nodding, bell-shaped flowers of a deep claret or wine-crimson tone, and they occur in lavish profusion and stain the alpine slopes with their rich hues. *P. Kingii* and *P. odontica* have flowered in cultivation, but *P. Valentiniana*, although it has been raised from seed several times and live plants have been brought home, has not yet been brought to maturity.* At present there are robust seedlings in many gardens, raised from seed sent home in 1948 by LUDLOW, SHERRIFF and ELLIOT under No. 13285A collected on the Doshong La. It is much to be hoped that this delightful little plant will become established in cultivation.

This year (1949) *P. Dickieana* has flowered in cultivation for the first time, from seed collected by LUDLOW, SHERRIFF and ELLIOT, under No. 13285, from the Lusha La. MR. AND MRS. J. RENTON of Branklyn, Perth, succeeded in flowering about forty plants, and sent several to London, though, unfortunately, they did not arrive in good enough condition to be shown. One of the plants raised at Perth is portrayed at Fig. 41.

P. Dickieana is a somewhat isolated member of the section *Amethystina*. In this section the flowers are generally campanulate and pendulous, but in *P. Dickieana* they do not droop; the narrow corolla-tube expands slightly beyond the calyx and the cleft corolla-lobes spread in a slightly oblique plane. The throat of the corolla is more or less closed by hairs. The specimens which flowered in Perth had lavender-violet

* In October, 1949, a plant raised from seed sent under No. L. S. & E. 13285A, flowered at the Royal Botanic Garden, Edinburgh, but the specimen gave a grossly inadequate idea of the real beauty of the species.

(H.C.C. 637) corolla-lobes, each with a chocolate-brown spot near the base and the centre of the flower had a five-lobed orange-yellow "eye".

There is, however, a wide range in colour in the species. One day on the south side of the Doshong La I came to a swamp—probably the same as that described by KINGDON-WARD on p. 114 of his *Riddle of the Tsangpo Gorges*—covered with masses of *P. Dickieana* in which it was possible to pick out four distinct colour forms. There was the most usual one in which the corolla segments were magenta to violet-purple. Another form had dull lilac-white corolla lobes with a diffused brown area towards the base and an orange eye. A third form had white lobes with an orange-yellow eye, and in a fourth the segments were pale buff diffusing to orange in the centre. I collected as many plants of each as could be carried with the other trophies of the day, and back in camp arranged them in front of the tent. The photograph at Fig. 42 shows the assortment. The range of colour cannot properly be appreciated in monochrome, but the variation in the "eye" markings is fairly clear.

The day on which we crossed the Doshong La into Pemako was one of the most memorable of the whole expedition and yielded a magnificent lot of plants which, at the height of the monsoon season, taxed the drying facilities to the limit. It was a day of lashing rain and driving mist, and the hillsides were streaked with foaming white torrents; the track to the summit of the Doshong La was now a torrential stream. On the way to the pass over the moorland we had often to wade through pools up to our knees. The Primulas and Rhododendrons in great profusion were magnificent: the cleansing rain seemed to intensify their brilliant colours. Over acres, the dark crimson bells of *P. Valentiniana* appeared to nod everywhere in the moorland clearings between huge cushions of dwarf Rhododendrons, but large colonies of other species made bold patches of colour. In bog hollows the nivalid *P. falcifolia* was conspicuous, and it grew in quantity along the watercourses. This is a very choice plant. From an attractive basal rosette the flowering stem bears 1-4 lovely pendent fragrant flowers with a lemon-yellow corolla, sometimes flushed deep apricot to brick-red on the reverse. Here and there *P. chionota* formed vigorous clumps on the hillsides, its flowers varying from primrose-yellow to deep magenta-purple. *P. Morsheadiana* was another common species. The most conspicuous Rhododendrons on the open moorland were *R. crebriflorum*, *R. mekongense*, *R. campylocarpum*, *R. Forrestii* and *R. paludosum*.

One of the loveliest alpine I know—*Diapensia Wardii*—was flowering beautifully (Fig. 48). This species surely combines all the attributes of an ideal alpine, and it is a great pity that it was never raised from our seed. It is not a common plant on the Doshong La—it was much more abundant on the Bimbi La, whence most of our seed came—but its rich rose-pink flowers borne on slender crimson pedicels were very conspicuous, and its congested habit with the branches closely covered with neat, shiny, evergreen, leaves makes it a most attractive plant.

On the summit of the Pass (17,500 ft.) we were met by terrific wind which drove the rain and sleet with merciless fury. We dropped quickly

down the south side to a small amphitheatre with the floor covered with huge boulders which just protruded from the snow. Then followed a steep rocky descent into a second cirque with the bottom formed of deep compressed snow, brought down and impounded by successive avalanches. At places, where this platform had collapsed by the action of hidden streams, sections of stratified snow as much as 20 feet in depth were revealed. The snow on the upper slopes was corniced and weathered into weird shapes. Where the hillsides were free from snow there was a covering of Rhododendrons, though only *R. cerasinum* was in flower with dazzling waxy crimson blossoms, each with five dark nectar pouches. From the second shelf we descended to a third, again covered with avalanche snow and enclosed by a steep amphitheatre of mountains. From the high rocks long white cascades poured into space to become dispersed in drifting spray clouds. Lastly, we descended to the swampy valley floor which was covered with a tangle of willows, *Lonicera* and *Rhododendron charitopes*. Between these shrubs grew a beautiful form of *Meconopsis simplicifolia* and an *Arisaema* with a crimson clubbed spadix protruding from a dull green spathe. On the hillside here, at about 12,500 feet, there was a profusion of a most striking plant—*Strobilanthes oresbius*—with long panicles of brilliant purple-mauve flowers. It grew up to 6 feet in height and made a lovely natural herbaceous border on each side of the narrow track. It was near here, on damp flats by the stream, that we came to abundance of *P. Dickieana* in its variety of colour forms.

Although Rhododendrons, in a medley of colour, dominate the high sodden moorlands, screes and avalanche slopes in the Tibetan Himalaya, other dwarf shrubs, such as species of *Berberis*, *Potentilla*, *Lonicera*, *Cassiope*, *Gaultheria*, *Vaccinium*, *Diplarche** (Fig. 46), *Salix* and *Juniperus*, mingle in the matted alpine scrub, and most of these are of considerable horticultural merit.

The evergreen Cassiopes are especially attractive, and by their stoloniferous habit spread and carpet acres of the open moorland and rocky hillsides, much in the same way as heather does in this country. With their myriads of dainty, white, pendent bells they are one of the chief glories of the Tibetan Himalaya. The erect fastigate branches, clothed with closely imbricated leaves, give the plants rather a quaint appearance.

In 1938 we collected four species of *Cassiope*—*C. fastigiata*, *C. pectinata*, *C. selaginoides* and *C. Wardii*—and, with the exception of *C. pectinata*, seed was obtained of all (Fig. 43). Apparently little success attended the efforts to introduce these plants and only a few plants of *C. Wardii* have survived. It is the most robust species and should grow well in a cool, moist, peaty corner where its stolons can spread. One specimen, originally raised from the 1938 seed by MR. and MRS. RENTON, has attracted a good deal of attention during recent years when shown by MR. R. B. COOKE at alpine shows around the country

* *Diplarche multiflora* is a lovely little ericaceous shrub, and the nearest approach to a Heath to be found in the Himalayas. It somewhat resembles *Erica carnea* in habit. Successive importations of seeds have not produced plants, but recently LUDLOW and SHERRIFF sent home two clumps by air from Bhutan, and these, it is hoped, will become established and be distributed.

(Fig. 44). It is a magnificent plant with attractively whiskered leaves and, among other distinctions, gained the Award of Merit on May 3, 1949. Plants of *C. Wardii* have been raised from seed sent home last year by LUDLOW and SHERRIFF, and it is to be hoped that the plant will become widely established and better known in gardens.

C. Wardii was described from specimens collected by KINGDON-WARD on the Temo La and the neighbouring Nyima La in 1924. We visited these passes, which cross the mountains north of the Tsangpo in the province of Kongbo, in 1938 and collected further material of the plant. But the species also grows on the main Himalaya and in magnificent profusion covers loose gravel banks, rock shelves, avalanche slopes and seeping screes on the Lusha La, the Tamnyen La and above Tripe. The original plants in cultivation, one of which received the Award of Merit, were raised from seed collected (under LUDLOW, SHERRIFF and TAYLOR 4734A) above Tripe on south-facing slopes where it grew with the amazing assemblage of beautiful species which I briefly described in a previous article (R.H.S. JOURNAL, vol. LXXII, 143-144 (1947)).

One of the finest introductions to gardens in recent years has been the Tibetan form of *Paeonia lutea*, which is locally abundant on gravel terraces in the lower Tsangpo valley and in the dry transitional zone in other parts of south-eastern Tibet. In habit, and in certain floral details, the plant diverges from typical *P. lutea*, a species of Yunnan and south-western China, and a critical assessment of these differences suggests that the two plants deserve separate taxonomic rank. Another Peony from the lower Tsangpo has now appeared in cultivation and may reach maturity during next season. This species is *P. Mairei*. In 1938 we made several gatherings of this plant, but the flowers were over and we only saw the fruits—bright scarlet gaping follicles revealing indigo-blue seeds. These seeds, sent home under No. 5350A, apparently did not germinate. The local Tibetans knew the plant under the name *kogo meto*, and they said that it had white flowers. It is 2-3 feet in height and grows in dry stony situations between 9,300 and 11,500 ft., sometimes in the dense shade of the evergreen oak forest, or in clearings amongst shrubs.

Thus, in 1947, LUDLOW, SHERRIFF and ELLIOT were anxious to re-discover the Peony, and they succeeded in this and secured an ample supply. The species flowers early in Tibet, towards the end of April, and seeds from which plants have been raised were harvested in August under No. 14231 (Fig. 45). *P. Mairei* was originally described by LÉVEILLÉ from specimens collected by MAIRE in Yunnan, and it is also found in Szechuan. The records from south-eastern Tibet represent a notable extension in its geographical range, and are another example of the close relationship between the flora of south-western China and south-eastern Tibet.

P. Mairei should be an interesting addition to the species population of our gardens, but it is doubtful whether it will find so much favour as its distinguished Tibetan neighbour at present grown as *P. lutea*.

THE PRODUCTION OF QUALITY IN APPLES

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*(Lecture given 29 November 1929, DR. H. V. TAYLOR, C.B.E., D.SC.,
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AT the outset of this lecture it seems desirable to define the term quality as applied to Apples. In my own mind I associate the following characters of the fruits with quality and it is these that I propose to discuss to-day in relation to factors concerned in production.

a. Physical and chemical properties of the fruits which make them pleasing to the eye and to the palate. These include the following:

- (i) *Physical*: size, shape, colour of skin and of flesh, firmness, texture of flesh (*i.e.*, crispness and juiciness to palate).
- (ii) *Chemical*: contents of dry matter, nitrogenous compounds, acids, sugars, tannins, aromatic compounds (giving particular flavours); ash and ash constituents.

b. Physiological characters determining storage changes and keeping properties.

c. Freedom from pests and disease organisms—affecting, in particular, appearance and storage properties.

FACTORS DETERMINING QUALITY

The factors that determine quality may be grouped under the following headings:

a. Materials: factors inherent to the trees—including varietal characters, rootstock characters and the effects of rootstocks on the scion varieties; age of tree; health of tree, in particular its freedom from virus diseases.

b. Environment: factors external to the trees. These may be subdivided into three sub-groups.

- (i) Natural conditions of the site—including the climatic factors of rainfall, temperature and sunshine; slope and exposure; the natural soil conditions; occurrence of parasitic organisms such as pests and fungi.
- (ii) Management factors introduced by the grower. These include soil treatment—cultural operations and manurial practices; control of pests and fungal and bacterial organisms; manual operations on the tree, such as pruning, fruit thinning, bark ringing, and root pruning; time of picking.
- (iii) Miscellaneous factors. Position of fruits on the tree—exposed and shaded fruits; position of fruits on the truss—terminal and lateral fruits; light and heavy crops; size of fruits.

Before discussing the effects of these individual factors on quality I would remind you that the ultimate quality of any crop is the result of the complex interaction of these orchard factors. Examples of such interactions will be given in the data presented.

In discussing aspects of quality it is, moreover, necessary to introduce certain terms in common usage to describe special "breakdown" conditions of fruits, due to abnormal physiological changes that occur both whilst the fruits are on the tree and during storage, associated with unsatisfactory quality.

The most important are: superficial skin scald, which refers to a browning of the skin; lenticel spotting, in which the lenticel areas break down and become brown, the condition usually being followed by invasion of breakdown areas by fungi; skin cracking and russetting; bitter pit and cork, which refer to brownish pitted areas in the flesh, either fairly superficial or scattered throughout the cortex; core flush, a browning of the core region; flesh breakdown, in which the cortex shows collapse and brown discoloration.

THE NATURE OF THE EFFECTS PRODUCED BY THE VARIOUS FACTORS

a. Materials

Varieties.—Each variety has its own peculiarities in respect to fruit quality in the same way that each possesses particular properties as regards vegetative characters and fruiting habits. Thus a variety may have special dessert or culinary properties, and it may be early or late and be a short or longer "keeper." Other varietal characters also affect problems concerned with quality, as, for example, growth habit of the trees, special climatic, soil and manurial requirements, particular susceptibility to pests and diseases and the reaction of the variety to control measures used against these organisms (*e.g.*, spray damage). Some of the ways in which varietal characters affect problems of quality are illustrated in discussing the effects of other factors below, but it may also be stated that varieties show wide differences as regards their susceptibilities to different physiological breakdowns. Thus Newton Wonder is very susceptible to bitter pit (Fig. 59) and to core flush during storage; Bismarck and Lane's Prince Albert to core flush (Fig. 55); Allington Pippin to lenticel spot; Bramley's Seedling and Cox's Orange Pippin to flesh breakdown (Fig. 56); Worcester Pearmain and Monarch are very resistant to flesh breakdown and core flush, and these troubles seldom appear even after prolonged storage periods.

Rootstocks.—Rootstocks are themselves distinct varieties and thus have their own peculiarities as regards reactions to soil conditions, requirements for mineral nutrients, etc. Thus Malling No. V rootstock may be cited as being very susceptible to potassium deficiency and Malling No. I to magnesium deficiency, which often means in practice that trees worked on these two rootstocks will give fruits with properties characteristic of these two deficiencies.

Rootstocks also produce special effects on scion varieties which greatly influence the properties of the fruits. The dwarfing rootstock

Malling No. IX, provides an outstanding example of such effects, the fruits associated with this rootstock tending to be large and to have especially high sugar content which makes them sweet to taste.

Tables I and II present data illustrating rootstock effects on storage quality and the chemical composition of fruits under different manurial treatments. In Table II it will be noted that the differences are only evident under the "manured" treatment and illustrate the differential reaction of two rootstocks to a given manurial treatment.

TABLE I

Showing Effects of Rootstocks and Manuring on the Development of Storage Break-down (Flesh Breakdown and Core Flush) in Cold Store, 1° C. Season 1933. Variety Worcester Pearmain

Rootstock	Showing % Breakdown under Various Manurial Treatments				Totals of %s each Root-Stock	Totals as % of Lowest Total
	No Manure %	Nitrogen %	Potash %	Nitrogen and Potash %		
Malling, No. I	10	17	5	48	80	127
" II	20	45	3	30	98	156
" III	13	15	21	39	88	140
" IV	7	43	38	44	132	210
" V	7	34	3	35	79	125
" VI	16	25	2	20	63	100
" VII	8	30	41	79	158	251
Totals of %s each Treatment	81	209	113	205		
Totals as % of Lowest Total	100	258	140	364		

TABLE II

The Effect of Manuring on the Sucrose Content of Apples on different Rootstocks

Size Grade (large to small)	M. I.		M. V.		M. X.
	Manured % Sucrose	Unmanured % Sucrose	Manured % Sucrose	Unmanured % Sucrose	Manured % Sucrose
1	3.37	—	—	—	—
2	3.51	—	2.90	—	—
3	3.32	—	—	—	3.10
4	3.36	—	2.47	—	3.12
5	3.26	2.75	2.18	2.36	2.92
6	2.47	2.40	1.81	1.97	2.26

Age of tree.—The important point to note in respect of age is that young trees produce fruits with very special characters and that these “juvenile” properties change with increasing age. The most important points are that the fruits on the young trees are abnormally large in size, they show a very special feature in their chemical composition in that both nitrogen and cane sugar (sucrose) contents are high and the fruits have poor keeping properties, being highly susceptible to bitter pit, shrivelling and storage breakdowns.

TABLE III

Showing the Effect of Age of Apple Trees on the Contents of Nitrogen and Sucrose in the Fruit

Variety	Number of Years Planted	Nitrogen in Fresh Weight %	Sucrose in Fresh Weight %
Allington Pippin .	3	0·0869	3·52
	5	0·0694	3·04
Worcester Pearmain .	3	0·0797	2·58
	5	0·0572	2·10
Worcester Pearmain . .	5	0·0531	3·19
	20	0·0381	2·54
Newton Wonder . .	3	0·0594	1·76
	5	0·0557	1·32
	10	0·0310	1·34

Virus diseases.—Certain virus diseases have been identified in Apples and it is likely that these will be largely transmitted by budding and grafting. Thus it is important that buds and grafts should only be taken from virus-free trees. An example of an Apple virus which prevents the normal development of the fruits and results in deformed and useless specimens is provided by “False Sting.” (Fig. 51). An outstanding example in Pears is the virus causing the condition “Stony Pit.” (Fig. 52).

b. Environment—Natural conditions of the site.

Climatic factors.—Three factors of climate requiring discussion are rainfall, temperature and sunshine. In practice these factors are inter-related in the climatic complex, since low rainfall areas are usually those with plentiful sunshine and a tendency to high temperatures. In Britain, it is unusual for dessert Apples to be grown commercially where the annual rainfall exceeds 35 inches or north of the latitude of The Wash. Reference to a map published in the *Ministry of Agriculture Bulletin* 133, *Apples and Pears*, will show how the centres of dessert Apple growing, where presumably quality is high, are contained within the area bounded by the August isotherm 68° F., which strongly suggests that temperature and light conditions are limiting factors to the production of high quality Apples in areas when August temperatures are below this level.

Certain features of quality associated with seasons of high rainfall (and low sunshine) and high sunshine (with high temperatures) call for mention.

Where rainfall is high, scab is usually a very serious problem and failure to control this disease may result in small, poorly coloured, spotted and cracked fruits. The fruits are also generally acid to taste and of low sugar content. In contrast, when sunshine and temperatures are at a high level, appearance is good, colour is high and sugar content good. High temperatures may, however, be associated with various forms of injury and are probably largely responsible for these, *e.g.*, water core followed by flesh collapse usually near the calyx ends of fruits; cracking and russetting of the skin as in Edward VII, flesh browning on tree (James Grieve), corky conditions in the cortex (tree pit) as in Newton Wonder, brown spotting in coloured areas of highly coloured fruits (Worcester Pearmain).

Because of the large variations in climatic conditions in different seasons, substantial seasonal differences in quality occur in fruits at any given centre and these differences may be accompanied by large differences in the chemical composition and storage properties of the fruits. The relationships between seasonal conditions and storage properties are very complicated and it is difficult to forecast whether fruits will keep well or poorly in any season, due to the fact that both sunny and wet seasons are associated with special harmful effects. Examples of differences in composition between two seasons are given in Table IV.

TABLE IV

Showing Seasonal Effects on Composition of Apples—Variety Allington Pippin.
Season 1931 dull and wet; 1933 hot and dry

Pruning Treatments	1931			1933		
	Dry Matter %	Acidity %	Total Sugars %	Dry Matter %	Acidity %	Total Sugars %
Spur Pruned, 3 Bud .	13.4	0.73	10.23	17.5	1.175	12.20
" " 5 Bud .	13.5	0.75	10.29	17.0	1.065	12.26
Regulated pruning (<i>i.e.</i> , branch thinning)	11.9	0.72	9.41	16.0	0.940	11.48
" " "	12.7	0.68	9.84	17.3	1.020	11.70
" " "	13.0	0.60	9.80	17.4	1.105	13.06
" " "	12.4	0.74	9.54	16.9	1.135	12.08
" " "	13.0	0.71	10.04	16.1	1.075	11.60
" " "	13.4	0.75	9.91	—	—	—
" " "	13.4	0.80	10.01	—	—	—

Soil conditions—Apples are grown under a wide range of soil conditions where other conditions of the environment are favourable and many soil defects can be successfully overcome by special cultural and manurial practices. Extreme conditions in soils should be avoided,

however, whenever possible if the production of high quality Apples is to be attempted since, on unfavourable soils, production is likely to be both uncertain and expensive. Examples of difficult soils are: chalk soils, due to their highly calcareous nature, which is likely to induce iron deficiency chlorosis in the trees; strongly acid soils, on which mineral deficiencies are likely to be prevalent; coarse gravelly soils, which are liable to drought effects and on which fluctuations in quality are usually large and difficult to control; poorly drained clay soils, which are liable to produce crops of poor quality in wet seasons.

Occurrence of parasitic organisms—Certain pests and diseases are liable to be prevalent in certain districts, often associated with special climatic factors, and in such areas it may be almost impossible for the amateur to produce high quality fruits. Thus in high rainfall districts scab and canker may produce especially severe effects and the wet conditions may prevent the application of adequate control measures. Then in dry areas, pests, such as red spider and codling moth, may reach unmanageable proportions and ruin crops of potentially high quality.

Management Factors

Cultural systems—The main cultural systems used in Apple production comprise permanent grass cover, cultivation with annual cover crops and cultivation without special cover crops. In considering the effects of these systems it is necessary to examine them from their long range aspects as well as from their immediate effects. From the long range aspect it is important to note that a system of continuous cultivation over a period of years is likely to result in deterioration of the soil structure and general fertility, and thus to a lowering of fruit quality. These bad effects may be offset to some extent by practices which tend to replenish organic matter, *e.g.*, by the use of bulky organic manures, but unfortunately practices such as these tend to lower dessert quality. Annual cover crops tend to check the ill effects of continuous cultivation, but the system is often difficult to carry out under trees and where rainfall fluctuates from year to year. The best system to ensure high quality produce, excepting under very dry conditions, is undoubtedly the permanent grass cover, combined with suitable cutting treatment of the grass to ensure that it is always kept short. The main effects of this system on the nutrition of the tree, and hence on the fruit, are as follows: nitrogen is decreased, potassium and phosphorus may both be increased and defective iron nutrition may be corrected or substantially improved on calcareous soils. The effect on nitrogen level is of great importance as it allows the level to be adjusted as desired by means of nitrogenous fertilizers.

The main effects of a system of grass culture on fruit quality are as follows: size is generally reduced, shape may be improved by decreasing ridges around the calyx cup, firmness is increased, colour is improved by promoting a lighter ground colour and increasing flush, nitrogen content is decreased, acid may be increased, total sugars are

increased (except where grass effect is excessive), flavour is increased with increasing sugar content, storage properties are improved both as regards liability to rots and physiological breakdowns.

Examples of grass effect and of nitrogenous manuring on chemical composition and on storage properties of fruits are presented in Tables V, VI, VII and VIII.

TABLE V

Showing the Effect of Cultivation and of a Nitrogenous Fertilizer on the Chemical Composition of two Varieties of Apples

Variety	Treatment	Dry Matter %	Nitrogen in Fresh Weight %	Acid in Fresh Weight %	Reducing Sugars in Fresh Weight %	Sucrose in Fresh Weight %	Total Sugars in Fresh Weight %
Newton Wonder	Grass only	12.73	0.0299	0.544	8.60	1.27	9.87
	Grass + Nitrate of Soda at 5 cwt. per acre	14.10	0.0316	0.558	8.50	1.92	10.42
	Cultivation only	12.87	0.0441	0.479	8.06	1.60	9.66
Lord Grosvenor	Grass only	10.16	0.0255	0.607	7.16	0.63	7.79
	Grass + Nitrate of Soda at 5 cwt. per acre	10.24	0.0375	0.645	7.39	0.81	8.20
	Cultivation only	11.47	0.0484	0.604	7.17	0.70	7.87

TABLE VI

Showing the Effect of Cultivation and of a Nitrogenous Fertilizer on the Storage Quality of Apples—Variety Newton Wonder. Ordinary Store: 25/4/28; Cold Store: 19/6/28.

Treatment	% Breakdown (Core Flush)	
	Ordinary Store	Cold Store
Grass only	0	21
Grass + 5 cwt. Nitrate of Soda in Spring	0	25
Cultivation only	16	47

TABLE VII

Showing the Effects of Grass and Arable Conditions on the Chemical Composition of Apples

Variety	Grass or Arable	Nitrogen in Fresh Weight %	Acidity in Fresh Weight %	Reduc- ing Sugars in Fresh Weight %	Sucrose in Fresh Weight %	Total Sugars in Fresh Weight %
Lord Grosvenor	Grass	0·0255	0·607	7·16	0·63	7·79
	Arable	0·0484	0·604	7·17	0·70	7·87
Allington Pippin	Grass	0·0356	0·639	7·57	2·91	10·48
	Arable	0·0456	0·841	7·27	3·39	10·64
Newton Wonder	Grass	0·0191	0·467	7·99	1·52	9·51
	Arable	0·0429	0·557	7·52	1·31	8·83
Lord Grosvenor	Grass	0·0270	0·710	6·54	2·05	8·59
	Arable	0·0426	0·663	6·02	1·33	7·35
Newton Wonder	Grass	0·0299	0·413	8·18	2·85	11·03
	Arable	0·0462	0·525	7·22	2·50	9·72
Allington Pippin	Grass	0·0177	0·845	6·93	3·18	10·11
	Arable	0·0694	0·827	6·61	3·04	9·65

TABLE VIII

Showing the Effects of Grass and Arable Conditions on the Development of Breakdown in Apples at 1° C.

Variety	Date examined	Breakdown %	
		Grass	Arable
Lord Grosvenor	18/2 '28	0	56
Allington Pippin	4/4 '28	0	69
Newton Wonder	7·5/29	38	85
Lord Grosvenor	20·2/29	0	43
Newton Wonder	8·5/29	11	71
Allington Pippin	20·2/29	6	25

Manuring—It may be taken as a general rule that high quality in Apples is associated with favourable levels of nutrition for healthy tree growth of the essential mineral nutrients and that fruit quality will suffer under conditions of serious deficiency or excess of any nutrient. At present twelve essential nutrient elements are known, viz. nitrogen, phosphorus, calcium, magnesium, potassium, sulphur, iron, manganese, boron, copper, zinc and molybdenum, and so far all excepting molybdenum have been shown to be important in the nutrition of Apple trees—molybdenum is the most recently established of the essential elements and its rôle in the nutrition of the Apple is as yet unknown, though it has been shown to be essential for the Myrobalan Plum.

Problems of quality in Apples in relation to nutrition usually concern deficiencies of the various elements and in Britain effects of excesses have generally been confined to nitrogen and potassium.

The effects on quality of an acute deficiency of any of the essential elements are always bad and must be avoided, though a slight deficiency of nitrogen often improves quality but may decrease yield.

Important deficiency effects of the respective elements are as follows:

Nitrogen: Colour is high, shape may be improved, firmness is increased, texture is crisp; acidity may be increased but this is offset by increased sugar content. Acute deficiency leads to lowered sugar content, poor flavour and a 'woody' effect to taste. Keeping properties are good.

Phosphorus: Colour effect is variable and fruits are generally of unattractive appearance, the ground colour being a dull green and the flush brownish-red; the fruits may also lack firmness; acidity is generally high in freshly picked fruits, but flavour may become "flat" and unpleasant. Quality is generally undesirable.

Potassium: Colour effect is variable and flush may be subdued or enhanced, but fruits often retain an immature appearance; acidity is low and total sugars may be high, but cane sugar is low; flavour is either sweet or lacking (woody). Storage properties may be satisfactory in ordinary temperature stores, though the fruits may shrivel excessively, but in low temperature stores fruits may suffer from low temperature flesh breakdown.

Magnesium: Colour is poor and fruits tend to retain immature appearance following severe defoliation of trees which results from the deficiency. Flavour is lacking (woody). (Fig. 47.)

Sulphur: Effects resemble those due to nitrogen deficiency.

Iron: Fruits are firm, ground colour is chlorotic and flush tends to be pronounced. Flavour is generally somewhat lacking due to low content of acid and sugars.

Manganese: Effects on quality often appear small unless the deficiency is acute when the fruits are of immature, woody type. (Few opportunities to study acute examples have occurred.)

Boron: Fruits are deformed and may show skin cracking and pitting, flesh pitting and browning of cortex or core area; they are generally useless. (Fig. 49.)

Copper: no data available.

Zinc: Fruits remain dwarfed and useless. (Fig. 50.)

Since excesses of nitrogen and potassium occur in practice the main effects of these are given below:

Nitrogen: Fruits are generally large and may be irregular in outline; colour is generally green and flush lacking or dull; flesh tends to be soft and to lack crispness; content of sugars is low and flavour tends to be acid. Storage properties are generally poor, due to susceptibility to rots and physiological breakdowns.

Potassium: When nitrogen is also high, fruits tend to be large and colour green; flesh is coarse in texture and dessert quality only moderate;

acidity and content of sugars both tend to be high. Storage quality is moderate, both as regards rots and physiological breakdowns.

Under low nitrogen conditions fruits are highly coloured, firm, crisp, with high sugar content and of high dessert quality. Storage properties are good. Excess potassium may also induce magnesium deficiency and result in typical magnesium-deficient fruits.

Control of pests and diseases. There are two points of importance in connection with the control of pests and diseases in relation to fruit quality. The first is that pests and diseases may cause unsightly blemishes or prevent the normal development of the fruits. Typical examples are apple scab and capsid bug. (Fig. 60.) The second point is that injuries caused by pests and diseases may provide starting points for the spread of rots during storage (e.g. scab) or they may hasten maturity (codling moth), in both cases shortening the storage period.

Pruning. Pruning systems on Apple trees vary between the extremes of light branch and shoot thinning and detailed spur pruning, important effects of the latter system being to curtail vegetative growths and to increase the exposure of the fruits to direct sunlight.

As regards the fruits, spur pruning increases size and colour, and these effects generally result in greatly improved appearance. Dessert properties are also improved and this is associated with an increase in the ratio cane sugar/reducing sugars. Storage life may be decreased and with the increased size there is a tendency for core flush to be replaced by flesh breakdown in the cortex. Differences between fruits from lightly pruned trees (branch or regulated system) and spur pruned trees are likely to be most evident in seasons of heavy crops when the numbers of fruits borne by the "regulated" trees are higher than those given spur-pruned treatment.

TABLE IX

Showing the Percentages of Reducing Sugars and of Sucrose for the Seasons 1928 and 1929, in Apples, variety Allington Pippin, receiving Differential Pruning Treatments.

Plots and Pruning Treatments	Season 1928 Light Crops		Season 1929 Heavy Crops	
	Reducing Sugars %	Sucrose %	Reducing Sugars %	Sucrose %
Buffer Row (3 buds)—Spur pruned	7.54	4.10	7.91	3.87
„ „ (5 „)— „ „	7.30	4.09	7.84	3.76
B. Branch thinning	7.10	3.39	8.25	2.43
H. „ „	7.58	3.59	8.55	2.80
D. „ „	7.49	3.98	8.87	2.66
J. „ „	7.25	4.03	8.27	2.99
F. „ „	7.05	4.25	8.32	2.77
L. „ „	7.54	3.50	8.54	2.77
Q.* „ „	7.25	3.39	8.23	—
Q. (Scorched Tree) Branch thinning	—	—	7.79	1.63

* Plot Q. no manure; others complete fertilizer (N.P.K.).

TABLE X

Showing the Relative Percentages of Core Flush and Internal Breakdown respectively of the Total Breakdown in Cold Store for Seasons 1928 and 1929 in Apples, variety Allington Pippin, receiving Differential Pruning Treatments.

Plots and Pruning Treatments	Season 1928 Light Crops		Season 1929 Heavy Crops	
	Relative percentages		Relative percentages	
	Core Flush %	Internal Break- down %	Core Flush %	Internal Break- down %
Buffer Row (3 buds)—Spur pruned .	38	62	5	95
„ „ (5 „)— „ „ .	20	80	4	96
B. Branch thinning	54	46	75	25
H. „ „ .	26	74	78	22
D. „ „ .	47	53	87	13
J. „ „ .	35	65	90	10
F. „ „ .	53	47	83	17
L. „ „ .	16	84	94	6
Q.* „ „ .	29	71	50	50
Q. (Scorched Tree) Branch thinning	—	—	48	52

* Plot Q. no manure; others complete fertilizer (N.P.K.).

Fruit Thinning. The operation of fruit thinning results in a decrease in the number of fruits carried and when a heavy thinning is given the fruits on thinned trees are usually substantially larger than on comparable untreated trees. Comparisons under such conditions show that the effects of thinning are generally similar to those of hard spur pruning, although excessive thinning may produce more severe effects on storage life. As for spur pruning, the effect on the cane sugar/reducing sugars ratio is a prominent feature. (Table XI.)

TABLE XI

Showing the Effect of Thinning on the Sugar Content of Apples

Variety	Thinned or Unthinned	Reducing Sugars in Fresh Weight %	Sucrose in Fresh Weight %
Lane's Prince Albert . . .	T.	6.94	2.80
	U.	7.24	2.39
Worcester Pearmain . . .	T.	10.58	3.26
	U.	10.75	2.52
	T.	8.08	2.28
	U.	8.33	1.89
Bramley's Seedling . . .	T.	6.95	2.36
	U.	7.59	2.17
	T.	8.95	2.61
	U.	9.40	1.92

TABLE XII

Showing the Effect of Fruit Thinning on the Storage Qualities of Bramley's Seedling—Season 1931

Treatment	Crop Weights per Tree	Breakdown in Cold Store, 216 days	
		Flesh Breakdown %	Core Flush %
Not thinned . . .	337 lb. : 231 lb.	18	10
Thinned . . .	189 lb. : 148 lb.	100	—

Bark-ringing and root pruning. The effects of these two operations on fruit quality are similar, though in practice those due to bark-ringing are generally more pronounced.

Bark-ringing is a useful method of improving quality in over-vigorous, light-cropping trees bearing large fruits of poor quality. The main effects on quality are similar to those produced by grass or by a fairly low level of nitrogen nutrition. The ringing operation must, however, be properly carried out or undesirable effects, both on the fruits and the tree, may result.

It is important to note that fruits of high quality produced by ringing and grass treatments respectively, although similar in appearance and dessert properties, differ in storage behaviour, especially in low temperature stores. Another disadvantage of ringing is that it may render the fruits, whilst on the tree, susceptible to high temperature injury.

The main effects of ringing may be summarized as follows: size is generally decreased, though sometimes it is increased where excessively high nitrogen conditions have resulted in small fruits; the fruits are firm and highly coloured, and the flesh is crisp, sweet and juicy;

TABLE XIII

Showing Typical Effects of Bark Ringing on the Content of Nitrogen and Sugars in Apples

Variety	Treatment	Nitrogen in Fresh Weight %	Reducing Sugars in Fresh Weight %	Sucrose in Fresh Weight %	Total Sugars in Fresh Weight %
Bramley . . .	Unringed	0.0328	5.35	3.21	8.56
	Ringed	0.0218	6.14	3.01	9.15
Bramley . . .	Unringed	0.0481	6.72	1.88	8.60
	Ringed, 1928	0.0367	6.24	2.13	8.37
	Ringed, 1929	0.0194	6.51	2.96	9.47
Bramley . . .	Unringed	0.0497	5.83	2.81	8.64
	Ringed	0.0314	5.73	3.12	8.85
Bramley . . .	Unringed	0.0375	6.96	2.36	9.32
	Ringed	0.0246	7.97	2.53	10.50

nitrogen content of the fruits is decreased and total sugars increased. Susceptibility to rots is similar to low nitrogen fruits, but "ringed" fruits are prone to storage breakdowns at low temperatures, particularly to superficial scald and flesh breakdown in the cortex.

Effects on composition and scald are illustrated in Tables XIII and XIV.

TABLE XIV

Showing the Effect of Bark Ringing on the Development of Scald in Cold Store

Variety	Treatment	Date of Examination	Scald %
Bramley's Seedling	Unringed, fruit thinned	24/3/30	0
	" not	"	0
	Ringed, fruit thinned	"	97
	" not "	"	63
Newton Wonder	Unringed	28/3/30	15
	Ringed	"	31
Newton Wonder	Unringed	7/5/30	0
	Ringed, 1928	"	0
	" 1929	"	44

Time of picking—early and late picking. Fruits acquire the properties associated with high quality, such as high colour, fairly large size and high sugar content, relatively late in the growth period, hence time of picking is important. Late picking, however, increases the rate of ripening in store and late picked fruits may suffer severely from storage rots and physiological breakdowns. The main features of early and late picked fruits are as follows:

Early pick: fruits are relatively small and poorly coloured, flesh is firm and contains considerable amounts of starch which is later replaced by sugars; flavour is lacking. During storage the fruits are liable to superficial scald.

Late pick: the size of the fruits is larger than those picked early and colour is also higher and the flesh softer; sugar content and acidity are relatively high and flavour well developed. The fruits ripen more quickly in store than the early-picked fruits and are more susceptible to both storage rots and flesh breakdown. In many instances where

TABLE XV

Bramley's Seedling—Early and Late Picks

Percentage Rots in Comparable Samples in Ordinary Temperature Store—1935 Crop

	Exposed Fruits			Shaded Fruits		
Early Pick	13	31	19	24	43	27
Late Pick	31	49	49	34	69	55

breakdown in early picked fruits takes the form of core flush, in the later picked fruits breakdown occurs in the cortex.

At Long Ashton we have been unable to confirm observations by other workers that early picking favours the development of bitter pit.

c. Miscellaneous Factors

Position of fruits on the tree—exposed and shaded fruits. Fruits exposed to direct sunlight are superior in appearance to those shaded by the foliage. They develop the most intense colour, are particularly firm and have the highest content of sugars.

Severely shaded fruits, on the other hand, may remain entirely green or the green may fail to develop and the skin remain partly chlorotic. Shaded fruits are often acid to taste due to their relatively low sugar content.

Exposed fruits may, however, have their appearance spoilt by high temperature injury of the water core type or the skin may suffer from russetting and cracking on the exposed sides of the fruits in sunny seasons. (Fig. 58.) In store, exposed fruits are more liable to develop bitter pit than shaded fruits, but the latter are more susceptible to rots and flesh breakdown.

TABLE XVI

Bramley's Seedling—Exposed and Shaded Fruits

Bitter Pit in Comparable Samples in Ordinary Temperature and Cold Stores—
1935 Crop

<i>Ordinary Temperature</i>							<i>Totals.</i>
Exposed . . .		41	36	9	61	37	184
Shaded . . .		32	14	2	46	50	144
<i>Cold Store</i>							
Exposed . . .		55	42	26	68	70	261
Shaded . . .		37	16	12	42	34	141

TABLE XVII

Bramley's Seedling—Exposed and Shaded Fruits

Percentage Rots in Comparable Samples in Ordinary Temperature Store—1935 Crop

						<i>Totals.</i>
Exposed . . .	13	31	10	19	18	91
Shaded . . .	24	43	10	27	23	127

Position of fruits on the truss—terminal (King) and lateral fruits. Lateral fruits, which are formed from the lateral flowers of the truss, differ in quality from those formed from the terminal flower and are superior in quality. Terminals tend to be relatively long in shape and the skin is generally smoother and the stalks shorter than for laterals. Flavour is also less full than laterals, and cane sugar and dry matter contents are lower. The terminals are also more liable to lenticel spot

breakdown and to rots following from this trouble, and they often develop severe rotting during storage. They may, however, remain firmer than laterals and show less shrivelling in store. (Fig. 57.)

Light and heavy crops. Differences between fruits from light and heavy crops are generally similar to those described for spur pruned and lightly pruned trees, and for thinned and not thinned crops. Thus fruits from light crops are usually large, with high sugar content, especially high cane sugar, and are frequently poor keepers, being susceptible to bitter pit and flesh breakdown. These poor keeping qualities render it inadvisable to store fruits from light cropping trees for any considerable length of time.

Size grading. When fruits from any crop are graded for size, the grading operation automatically grades other characters of the fruits, such as colour, flavour, content of certain chemical constituents, particularly cane sugar, ash and potash content, and also storage properties. Table XVIII illustrates a typical effect of size grading on chemical constituents.

TABLE XVIII

Showing the Relationship between Size Grades and Chemical Constituents of Apples—Variety Allington Pippin

Size Grade. (large to small)	Reducing Sugars in Fresh Weight %	Sucrose in Fresh Weight %	Total Sugars in Fresh Weight %	Ash in Fresh Weight %	Potash in Fresh Weight as K_2O %	Potash in Ash as K_2O %
1	10.19	3.09	13.28	0.19	0.098	51.0
2	10.41	2.68	13.09	0.16	0.084	50.5
3	10.60	2.58	13.18	0.16	0.081	49.6
4	10.39	1.70	12.09	—	—	—
5 and 6	10.02	0.89	10.91	0.12	0.048	45.4

CONCLUSION

In concluding this lecture, I should like to emphasize some of the points discussed which are of special importance in attempting to produce Apples of high quality.

In the first place it is necessary to recognize the various points which constitute good quality—size, shape, colour, texture, flavour and storage properties. In any particular garden or orchard one or more of these factors may be unsatisfactory for the special end in view and usually substantial improvements can be effected by attention to the points I have discussed to-day.

It is important to start right, to plant suitable varieties on rootstocks whose characteristics are known, and to see that the trees are healthy and clean. The limitations of the site and the special features of the climate, particularly of rainfall and sunshine, must be recognized.

Extremes of soil conditions, the very heavy and the very light, the poorly drained and droughty, the highly calcareous and the strongly

acid, should be avoided where possible as these conditions raise difficult problems in tree nutrition and are often associated with poor or variable quality. High levels of cultivation and manuring will often produce high yields, but quality may be only moderate or low under these conditions, shape, colour, flavour and keeping properties being all adversely affected. Over-liming should be avoided. Grass culture combined with frequent cutting of the herbage, which should be left to rot *in situ*, usually affords the best conditions of nutrition for high quality production. A fairly low nitrogen level will often ensure high dessert quality and good keeping properties, and it is important to learn how to adjust the nitrogen supply by cultural practices and manuring.

An efficient control of pests and diseases is essential for high quality production. Manual operations on the tree, such as pruning, fruit thinning and bark ringing can be used to regulate size, colour and flavour, but they also affect storage properties and these effects must also be appreciated.

Exposure and shade, the position of fruits on the truss and the time of harvesting also produce significant effects on quality, and management practices must take due regard of these points.

NEW AND NOTEWORTHY PLANTS

Calceolaria Darwinii

A NUMBER of years ago I wrote an article for a gardening publication on the cultivation of "difficult" rock-plants and complained how difficult it was to keep *Calceolaria Darwinii* in good health in the garden. Some months later a British farmer in Patagonia wrote to me saying that *Calceolaria Darwinii* grew wild on his farm. He wrote that it grew on gravelly soil but always in places where it was shaded from the morning sun. This tip was too good to miss, so we moved our plants, or what remained of them, into a position on the "Billiard Table," where they were well shaded from the morning sun. This is a raised bed about 3 feet high, constructed of old railway sleepers. It has good drainage of broken bricks at the bottom and is then filled with a mixture of soil, sand and peat. We call it the "Billiard Table" because it looked like one before it was planted. It is most useful for growing small plants that need careful cultivation. *Calceolaria Darwinii* has grown in this position for many years, ever since some plants were given me in 1930 by that great gardener, my friend the late MR. CHARLES MUSGRAVE, but never have they flowered as they did this year. This hot summer, however, has been a sad trial for them, or their over-indulgence in flowering has perhaps overcome them, as they are looking somewhat dishevelled and sorry for themselves at this moment. (Fig. 39.)

F. C. STERN

ROSES AS FLOWERING SHRUBS

J. Wilson

GENERALLY speaking Roses are usually planted too sparsely, with the result that too much soil is visible at all seasons.

In the average garden hard pruning of Roses is more often a failure than a success; many fail to recognize that the Rose is naturally a shrub and not an herbaceous plant to be cut down more or less to ground level annually.

Enthusiasts are loud in their praises for the merits of hardy shrubs, including Rose species, but few recognize the virtues of some strong growing Hybrid Tea and Hybrid Perpetual Roses when they are allowed to develop into shrubs.

Few hardy shrubs have as long a flowering period as these Roses which bloom profusely in June and September and more or less continually between these periods. Grown as shrubs they must be properly sited; the bushes should be massed in comparatively large beds or borders, or in a suitable formal setting as shown in the photograph. (Fig. 61.) They are entirely out of place in small formal beds.

When in flower the effect is a glorious display of colour and, although the individual blooms may not possess the form of the modern varieties, the general effect compares favourably with the performance of most shrubs.

Once established these Roses require the minimum of labour, and are capable of carrying on over a period of many years.

Unless one is familiar with the behaviour of such Roses it will be assumed that the bushes are liable to become leggy and unsightly, but such is not the case, as young growths are frequently produced from the base of the old, affording from time to time an opportunity to renew the bushes.

Not all varieties of Hybrid Teas will develop into shrubs, but owing to their natural mode of growth there are a number which usually flourish wherever soil conditions are favourable or where Roses grow reasonably well.

Plant at not more than 2 feet apart in each direction and prune rather severely the season after planting. The following and subsequent seasons strong growths should be lightly pruned with the object of gradually building up a good framework. Remove the weakest growths and prune hard those of moderate vigour for the purpose of encouraging strong shoots to flower the following season. Sizeable bushes are produced in about three years and when fully developed these should be about 4 to 4½ feet high after each annual pruning. During the flowering season the bushes should present a solid mass of growth 5 to 6 feet high as shown in the photograph of the variety 'Dainty Bess.' (Fig. 62.)

Varieties which have been found suitable for growing in this form include some strong growing Hybrid Teas and Hybrid Perpetuals such as:—

Tea and Hybrid Tea Roses

Betty Uprichard (Salmon carmine)

Caroline Testout (Bright rose)

Dainty Bess (Salmon pink, single)

General McArthur (Red)

Lady Hillingdon (Orange yellow)
 Ophelia (Salmon flesh shaded rose)
 Red Letter Day (Crimson, semi-double)

Hybrid Perpetuals.

Capt. Hayward (Bright crimson)
 Frau Karl Druschki (White)
 Hugh Dickson (Red)
 Mrs. John Laing (Soft pink)
 Ulrich Brunner (Bright cerise red)

Other varieties worthy of a trial include:—

Edouard Renard (Deep pink, orange shading)
 Etoile de Hollande (Dark red)
 Hector Deane (Salmon orange)
 Lady Sylvia (Flesh pink)
 Lucie Marie (Apricot yellow)
 President Hoover (Orange red)

NOTES FROM FELLOWS

A yellow flowered form of Pæonia Potaninii

SOME twenty years ago I was given, most appropriately by COLONEL F. C. STERN who already then was greatly interested in the genus, some seeds of *P. Potaninii*. These germinated well and I soon had a large clump covering many square yards and growing 3 to 4 feet high.

In the summer of 1946, I noticed a yellow flower near the outside of the clump—the normal colour of the flowers of my plant is dark maroon. I picked and pressed this and later found several more yellow flowers near the plant from which I had picked the first. At the same time I noticed that the leaves of the plants bearing the yellow flowers were differently coloured too. In the normal plants the petioles, petiolules and the midrib of the segments and the lobes (parts which might unscientifically be described as the veins of the leaves) are coloured red, while in the case of the plants bearing yellow flowers they are coloured pale primrose yellow.

P. Potaninii is easy to propagate; it spreads freely by underground stolons, and its seed germinates well. It is, of course, impossible to say why some of my plants have apparently lost some pigment which causes the change of colour in the flower and in the leaves. The first pressed yellow flower was sent by me to the Royal Botanic Gardens, Kew, who stated that this was not the var. *trillioides* of *P. Potaninii* but a yellow flowered variant of that species and that they had failed to trace a previous record of such a variant.

The flowers of this species hang down amid the foliage and are almost invisible unless the leaves are lifted; in the case of my yellow-flowered form the flowers are brighter and therefore more prominent. To this extent it is an improvement on the normal form and an interesting plant. I have not yet had time to ascertain whether seed from the yellow form comes true to colour, but I am making some trials to find out.

MAJOR ALBERT PAM, O.B.E., M.A., F.L.S., V.M.H.

Plant Growth under Controlled Conditions

The primary aim of the horticulturist is to provide for his plants those conditions of soil and environment which will enable them to grow in a way which will give him the maximum return either in crop or æsthetic enjoyment. It is put this way because it is worth remembering that it is not necessarily the maximum amount of growth that is required of any plant. Thus, a fruit tree or a tomato plant which makes immense growth may produce less of the desirable part of the plant, the fruit, than one of much more moderate growth. Conversely, a lettuce or a carrot plant which flowers freely is of no value to its cultivator, unless he is growing a seed crop.

A plant which is growing "naturally," that is, in its normal wild habitat, will tend to assume that type of growth which will best ensure its survival in competition with all its neighbours, and this growth will usually focus on the reproductive phase. The horticulturist is always "interfering with Nature" in attempting to control the growth and development of the plant to his special needs. If we were never to "interfere with Nature," as some confused minds would assert, we should not even hoe our fields for the removal of weeds, let alone grow plants in frames and glasshouses.

The investigation of the factors of the plant's environment which determine its "behaviour" is the special field of the experimental plant physiologist. To analyse the effects of the wide range of interrelated factors which make up the environment he must have each one under his control so that he may determine how variations in its value react upon the plant. Up to now, no one experimental station has been able to construct equipment in which all the factors of light, temperature, humidity, gas content of the air, wind, rain and fog could be simultaneously and independently controlled and varied. Investigators have had to be content to experiment on one or two of these, maintaining the others either at some arbitrarily fixed value or, more often, leaving them uncontrolled.

Now, through the munificence of Mr. Harry Earheart, president of the Earhart Foundation of Ann Arbor, Michigan, it has been possible to construct at the California Institute of Technology in America, a laboratory in which each and every one of the factors mentioned is independently controllable over a wide range. In this laboratory, which has been, perhaps not very aptly, nicknamed the "phytotron" in analogy with the cyclotron of experimental physics, it is hoped to provide for physiologists, first, plant material for research of a uniformity never previously achieved on such a scale and, second, a means of analysing and assessing the importance of most climatic factors on plant growth and development.

The most elaborate means of ensuring constancy of control, freedom from all risk of disease and for the recording of results have been provided and a perusal of the description* leaves little wonder that the cost of building and equipping this unique laboratory was close on half a million dollars.

* "The Earhart Plant Research Laboratory," by F. W. WENT, *Chronica Botanica*, Vol. 12.

Botanists, horticulturists and agriculturists will await with the keenest interest the far-reaching results which should come from the new institution. In the meantime, workers in the field of environmental physiology in this country and elsewhere will not be discouraged by reason of their more modest facilities from continuing their studies of special aspects.

R. H. STOUGHTON

Can we increase the vigour of Difficult Species?

It is widely recognized in horticulture that the F_1 progeny of a cross between two related species often exhibit hybrid-vigour (heterosis). The genetic principles that lie behind this phenomenon lead one to expect that gardeners could raise crosses *within* a species that may be more vigorous than their parents.

Rarity has been interpreted by J. L. STEBBINS, JR. (in *Madroño*, Vol. 8, p. 248, 1942) as being due to genetic homogeneity, rare species consisting of relatively few biotypes that are themselves more or less homozygous. If this hypothesis is correct—and it has been widely accepted—then it follows that if two geographically isolated races of a rare species are crossed, the biotype-supply will be replenished and a more vigorous heterozygous race will result. In our gardens we try to grow a great many plants, rare in nature, that are persistently difficult. If individuals of these could be crossed with individuals of the same species introduced from a different natural locality, it seems possible that we may be able to raise progeny of greater “aggressiveness” than the races we already cultivate.

P. H. DAVIS

Forms or Hybrids

At the present time there is a growing tendency to attribute all changes that occur in Alpine plants to hybridization. Hybrids* do occur, there is no doubt about that, but to make the sweeping assertion that every observed change seen in our plants is due to the crossing of one species with another has very little evidence to support it. In this short note I should like to deal only with one plant, *Gentiana Farreri*, which has been growing in my garden for some seventeen years and I may say has been under close observation and the subject of some little experiments which have been described elsewhere.

G. Farreri was found by FARRER on Thundercrown in Tibet in 1914. Seeds were sent to the Royal Botanic Garden at Edinburgh. The first flowers appeared two years later and it is from this stock that all the *G. Farreri* of the present day have been derived. FARRER described the colour as a “fierce luminous Cambridge blue.” The plant created quite a sensation when first exhibited. The shape and colour, particularly the colour of the flowers, were unique. Unfortunately that was long before the publication of the Horticultural Colour Chart. The general belief among Gentian growers appears to be that the colour was near to the Kingfisher Blue of the Chart. The blue had a tint of green in it. The only concrete evidence I have of the colour, is a water-colour drawing done in 1935, in which the lobes of the flower match with Kingfisher

* The word ‘hybrid’ is used in this note to refer to an inter-specific cross.



Colour Photograph, The A.T.F. Co.

FIG. 39. *Calceolaria Durrantii* at Highdown, Goring-by-Sea, Sussex, 1949
(See p. 166)



Colour Photograph, N. K. Gould

FIG. 40. *Meconopsis betonicifolia* and *Primula chiogensis* in the Wild Garden at Wisley, June 1949



Photo, Downward

FIG. 41—*Primula Dickieana* Plant grown by MR. AND MRS. J. REYNOLDS of Perth from seed sent from S.E. Tibet (See p. 87)



FIG. 42—Forms of *Primula Dickieana* from the Dezhong La. (See p. 88)



FIG. 43 - *Cassiope schagnoides* covering a hillside in S.E. Tibet
(See p. 89)

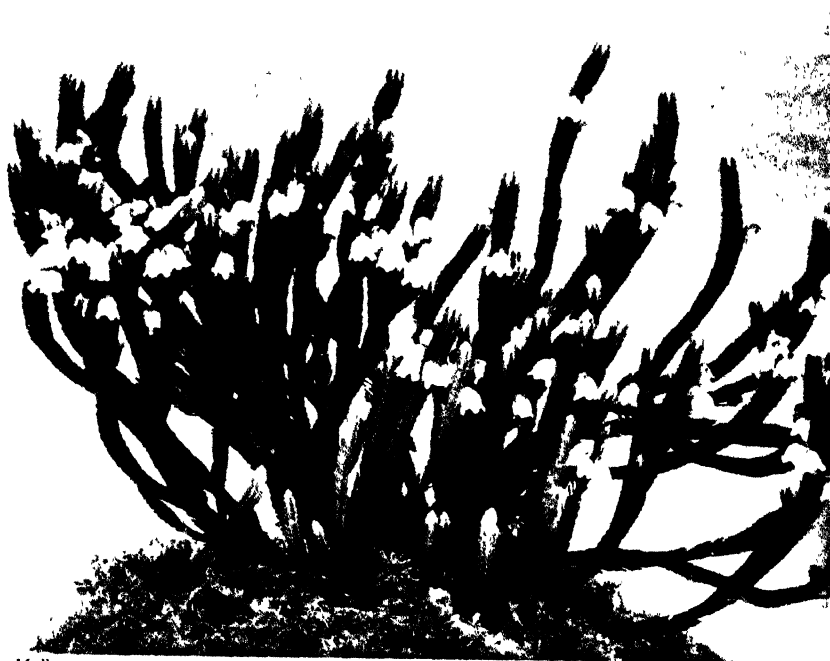


Photo. Malby

FIG. 44 - *Cassiope Wardii*. A plant grown by MR. R. B. COOKE of Kilbryde, Corbridge-on-Tyne, Newcastle, which received an A.M. on May 3, 1949. It was raised from seed collected in S.E. Tibet (See p. 86)



FIG. 45—*Paeonia Mairei* from the lower Tsangpo valley (See p. 90)



FIG. 46—*Diplarche multiflora* on the Lusha La (See p. 89)

PRODUCTION OF QUALITY IN
APPLES

FIG. 47—Well-grown Apple tree
variety Sweet Alford, age 14 years.
It has recently become magne-
sium deficient, causing premature
defoliation. As a result the fruit
fail to ripen and are small and
woody. (See p. 99)



U.S.
Larkspur
Research
Station



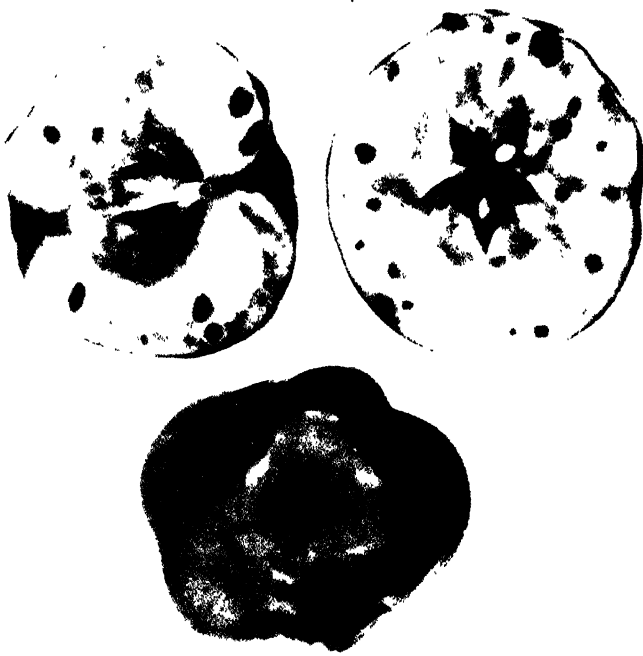


FIG. 49 Boron deficiency Variety Fameuse Fruits are deformed and show corky areas in flesh and browning of the core area
(After A. B. BURRILL, Cornell University Extension Bulletin 428 (1949)
(See p. 90)



Photo, Long Ashton Research Station

PRODUCTION OF QUALITY IN APPLES

FIG. 50 Zinc deficiency This results in severe dwarfing of fruits Plate shows young Apple fruits from zinc deficient tree (left) and comparable fruit from healthy tree (right) (See p. 99)

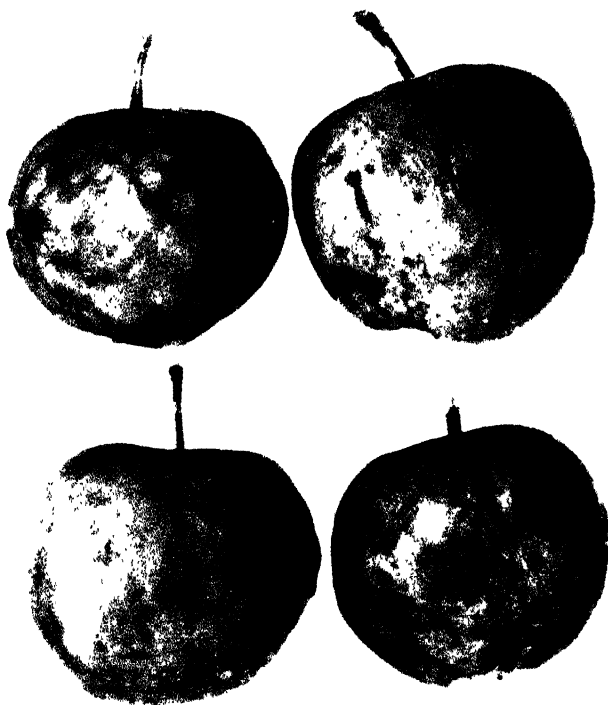
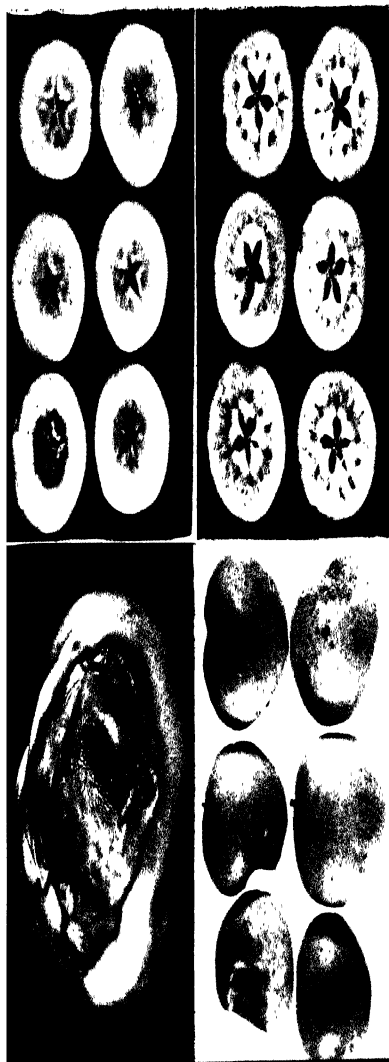


FIG. 51 False Sting, a virus disease of Apples, variety Sweet Alford. Note lesions in skin. Fruits fail to develop in a normal way. (See p. 94)



PRODUCTION OF QUALITY IN APPLES

FIG. 52 Stony Pit, a virus disease of Pears, variety Doyenne du Comice. The surface is irregular in shape and is severely pitted. The flesh shows corky areas similar in appearance to Bitter Pit and Cork in Apples. (See Figs. 49 and 59) (See p. 94)



g. 53 (top left)—One form of high temperature injury, variety Bramley's Seedling. Note the sharp denaturation of the injured area. (See p. 95)
 g. 54 (bottom left)—High temperature injury of Allington Pippin. Note the depressed areas near the calyx end of the fruits. The injury occurs during heat wave.
 g. 55 (top centre)—Core Flush, variety Bismarck. Some varieties, notably Bismarck and Newton Wonder, tend to develop this type of breakdown in store rather than in the field.
 g. 56 (bottom centre)—Flesh Breakdown. It is also a common form in smaller and poorer grades of fruits. (See pp. 92 and 101 Table XX)
 g. 57 (extreme right)—King Fruits, variety Allington Pippin. Note long narrow shape, excrescence at stalk end and lenticel spotting followed by extensive rotting. (See p. 104)

PRODUCTION OF QUALITY IN APPLES



Fig. 58 (left)—Skin cracking of the variety Edward VII. This occurs on this variety in fruits exposed to bright sunlight and is similar to the Drought Spot symptom caused on some varieties by boron deficiency. The condition in Edward VII has not been improved by boron treatment. (See p. 104)
 Fig. 59 (centre)—Bitter Pit in Newton Wonder. In this variety the pits are often found and show russeted areas on the skin. (See p. 92)
 Fig. 60 (right)—Capitid markings on Apples. The fruits are dwarfed, deformed and show russeted areas on the skin. (See p. 100)



Photo, Malby

FIG. 61—Rose 'Hugh Dickson' at Trent Park (See p. 107)



Photo, Malby

ROSES AS FLOWERING SHRUBS

FIG. 62—Rose 'Dainty Bess' (See p. 107)



FIG. 63--Tulip bulb attacked by Grey Bulb Rot and showing the resting bodies (*sclerotia*) of the fungus (See p. 115)



Photos, Plant Pathology Laboratory, Harpenden

GREY BULB ROT OF TULIP

FIG. 64—Tulip shoots killed by Grey Bulb Rot (See p. 115)



FIG. 65—Dahlia Trials at Wisley, October 10, 1949 (See p 130)



Colour Photographs, N. K. Gould

FIG. 66—Antirrhinum Trials at Wisley, July 20, 1949 (See p 117)

Blue 50/2. The drawing has been kept covered and is unlikely to have faded appreciably. Is our recollection of the original green tint exaggerated with the years?

Diligent enquiries have failed to find anyone who claims to have *G. Farreri* with flowers of the original colour. I am told that *G. Farreri* readily hybridizes with other gentian species growing near it and that all the plants now growing under that name are "not true," by which, I take it, is meant the plants are hybrids. To quote from one letter received in answer to a request for sample flowers, from one of our Botanic Gardens. "Our own stock is not true, so there is no use in sending our flowers." While bowing to eminent authorities in the Horticultural World, I do not believe that all our deeper coloured *G. Farreri* are hybrids and for the following reasons:—

(1) If all are hybrids, it means the original species has died out. *G. Farreri* is an easy plant to propagate vegetatively by division in March or by rooting cuttings. Nurserymen usually prefer to root cuttings if possible rather than raise plants from seed.

(2) *G. Farreri* could only hybridize with another gentian species if both are in flower at the same time. The season for *G. Farreri* is in late August or early September. *G. septemfida*, *G. lagodechiana*, *G. Loderi* and *G. cachemirica* are all earlier than *G. Farreri*. In my garden the first two are over and have set seeds before *G. Farreri* comes into flower. The other two although earlier still have open flowers. *G. sino-ornata* and *G. Veitchiorum* are much later and many of the flowers of *G. Farreri* will have set seed before they open. The pollen of *G. sino-ornata* is probably the most likely to find its way to the flowers of *G. Farreri* because it is grown in such large quantities, being the easiest of all the Autumn gentians to propagate and grow. *G. Macaulayi* was the result of a deliberate crossing of *G. Farreri* and *G. sino-ornata*. He would be a very casual observer who could possibly mistake *G. Macaulayi* for *G. Farreri*. Not only is the colour different but the leaves are wider and shorter. Strong tufts of leaves appear from the nodes of the flower stem, giving the plant quite a bushy appearance in contrast to the slender grass-like leaf growth of *G. Farreri*.

(3) If the present *G. Farreri* is a hybrid then according to Mendel's Law, the original characters of the parents (in this case the colour) should reappear in succeeding generations. Several generations have been raised in my garden during the past seventeen years, but there is no sign of a reappearance of the green tint.

(4) Change in the colour of the flower of certain plants is well known, for instance the Hydrangea, but that change in colour is due to chemical action on the soil solutions in one growing season, whereas the change in the colour of *G. Farreri* has been gradual and seems to be the cumulative effect of many differences the plants find in our gardens, which vary in many respects from those on Thundercrown.

Surely the evidence is against the hybrid theory and in favour of the plants we now have being still a true species.

G. H. BERRY

The Highlands, Ridgeway,
Enfield, Middlesex.

The Life of a 'Variety'

I was particularly interested in the article by MR. JAMES KELWAY in the July issue of your JOURNAL on the Life of a 'Variety.' I discussed this matter many years ago with MR. PITTMAN, B.A., B.SC., at the time West Australian Government Plant Pathologist and formerly of the Waite Institute, and while not pretending to have scientific knowledge myself on this subject, am but trying to record MR. PITTMAN's opinion, expressed when I said that a variety deteriorated.

MR. PITTMAN claimed that deterioration of any variety was due to disease or to the failure to cull out inferior "sports." He referred to a farm on which a strain of our "Delaware" potato had been grown for twenty years without its having shown deterioration. "Rogueing" had been rigorously carried out. On other farms in the locality the variety had deteriorated because of virus diseases until yields were only between 2 and 3 tons per acre.

With respect to Gladioli I cannot go back as far as MR. KELWAY to the Gladioli of the 1870's to the 1890's. I did grow such as were great Gladioli at the beginning of the century, 'America,' 'Prince of Wales' and others whose names I forget. These, as so many other varieties of flowers, passed into oblivion, because newer varieties were so much better.

In this connection MR. PITTMAN pointed out that most flowers sported, some much more than others, but the ordinary grower, whether amateur or professional, took little or no notice of a "sport" except one in colour, whereas there was every reason to believe that "sporting" was going on all the time, in other characteristics, such as, better or worse stem, more or less buds on a spike; only generally it was for the worse. When reproduction was carried out from all the plants of a variety, the deterioration, due to sporting must, in the course of a number of years, cause the variety to be passed out. This is what has happened apparently in the U.S.A. with the famous variety 'Picardy', which it is claimed is being cast out by many cut flower growers because it is becoming more and more club headed. On the other hand amateurs are continually showing spikes of the variety, which they had reproduced only from their best plants, as fine as ever it was.

Some amateurs in Western Australia, who exhibit spikes at the show almost certainly as fine as anything in the world, put down part of their success to reproducing only from the best spike.

A good many years ago I was asked by a Nurseryman in Western Australia, who grows possibly 250,000 Gladioli for his shop, to go round his plots and see if I could give my advice. I pointed out some plants obviously infected with virus and a number of others that did not look as healthy as they should do. I said "You have not time, unless you get an epidemic of disease, to keep taking odd plants to the Pathologist. Anything you think does not look healthy, root it up at once and burn it, then you will have a number that are short headed (I pointed out some). Though healthy looking, leave them until you cut the spike and then pull the plant up. They can be collected afterwards and then destroyed." This advice was but putting into practice what MR. PITTMAN had advised.

Comparatively lately the member of the firm who runs the nursery said to me "I have faithfully followed your advice and it is remarkable to-day how few plants are culled out." Scientifically I realize that this episode was not an experiment, nor did it prove anything, but I do claim that it makes one think.

If you could turn up the records of the Daffodil Conference, which took place some years before the war, I think you will find some gentleman told how he had bred up from one bulb a better 'Sir Watkin' and a day or two later, on a visit paid to his nursery, he showed what he had spoken of, i.e. the benefit of selection. Either his one bulb selected had sported a better flower or it had remained the same and the others sported worse.

The whole subject is a very interesting one and so far as my particular flower is concerned, the *Gladiolus*, I have not read of any work being done on the subject anywhere, even in U.S.A., where so many research stations, including most of the many Universities, are doing some work of investigation on this flower.

CLAUDE L. PIESSE

Bassendean,

Western Australia.

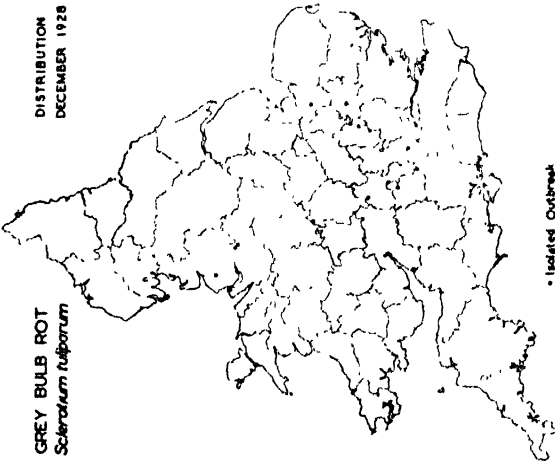
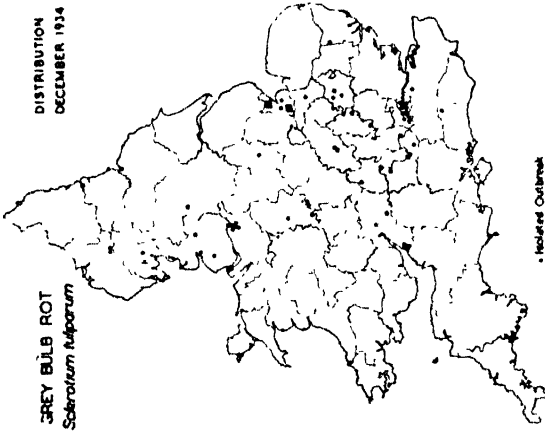
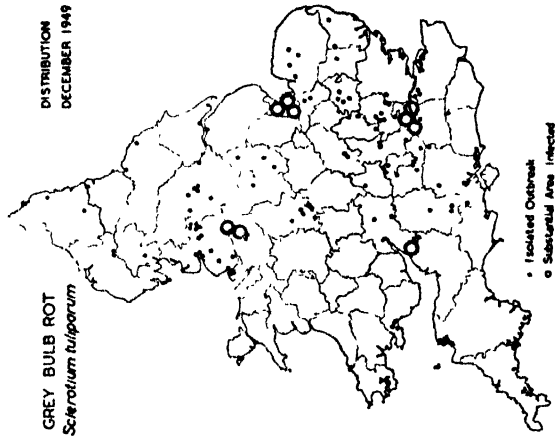
GREY BULB ROT OF TULIP

W. C. Moore

(DIRECTOR, PLANT PATHOLOGY LABORATORY, HARPENDEN)

THE disfiguring spots that develop most years on the leaves and petals of Tulips are a familiar and irritating sight to most people who grow the plant. It is true that in a dry and sunny spring the spots do little more than cause minor blemishes, but if prolonged wet or humid periods occur between March and May the disease spreads very quickly indeed and may completely ruin ornamental and commercial Tulip beds. It is because of its rapid spread that the disease was named "Fire." Experienced growers are aware that severe attacks of Fire occur only about once every three or four years, and are always worst where the bulbs are left down more than a year. They know, too, that late planting in November, deep planting, and wide spacing all help to check its appearance. Many have also learnt by experience the wisdom of inspecting the beds once or twice soon after the shoots have emerged, with the object of removing and burning all the plants that come up with mouldy or malformed shoots, for it is these mouldy shoots that act as centres from which Fire spreads. But though many know Fire few are aware that during recent years another Tulip disease, and in some ways a much more insidious and dangerous one, has gradually been establishing itself in this country.

My main purpose here is to draw attention to this second disease, or Grey Bulb Rot as it is called, and to the need for checking it before it becomes the real menace it threatens to be. Grey Bulb Rot has been known in Holland since 1884, but was not recognized in this country until found at Kew in 1922. During the next few years it was seen here and there occasionally, but from about 1928 it began to turn up fairly



The spread of grey bulb rot of Tulip

regularly. The accompanying maps, which give the known distribution of the disease in England and Wales at the end of 1928, 1934 and 1949, illustrate better than words can express the rapid extension of the disease. The total numbers of recorded attacks have no great significance, for there are probably many which have never come to light, but it is evident that few English counties are now completely free from it, and in several districts—indicated on the map by rings—the disease is prevalent. It frequently occurs under glass in forced Tulips, and in the open is a source of much loss and disappointment in private gardens and commercial fields alike.

It should not be difficult to recognize Grey Bulb Rot in field or garden. The first thing to attract attention is the presence here and there among healthy and flourishing Tulips of bare patches where the plants have not come through. Sometimes a few diseased shoots or even an apparently healthy plant or two may be the only visible sign that bulbs were planted in these patches, and these usually collapse and die within a few weeks (Fig. 64.) The patches are often only a yard or so across to begin with, and it is not unusual, especially in private gardens, to blame slugs or soil insects and leave it at that. The following year, however, the patch is larger and in time, if Tulips continue to be planted, whole beds may remain bare. Experience in forcing boxes is much the same; failure to produce shoots leads to gaps in the boxes, while many of the shoots that do appear are crippled or consist merely of badly torn, ragged foliage. If bare patches are found in a Tulip bed Grey Bulb Rot can be suspected at once. Actual proof is not so easy and specialist advice may be necessary.

First of all try to find some of the bulbs that were planted in the bare patches and carefully dig them up. If the trouble is Grey Bulb Rot you will notice that the young shoot is soft and rotten or is missing altogether; that the soil tends to cling to the nose of the bulbs; and that the roots seem to be well developed and the lower half of the bulb is frequently quite normal. Take a few of the bulbs and by degrees knock or wash off the soil until the neck of the bulb is exposed. Then peel off the outermost brown scale and cut one or more of the bulbs lengthwise. You may find as you remove the soil that it is permeated with a whitish mycelium: and you will certainly discover on cutting the bulbs that the scales are discoloured grey or pinkish-grey from above downwards. The rot may or may not reach the bottom of the scales and the basal plate. You can be quite certain the disease is Grey Bulb Rot if you search for and find on the rotting shoot, among the soil at the nose of the bulb, or under the brown covering scale some white, brown, or almost black, flattened or rounded bodies ranging in size from that of a mustard seed to that of a Sweet Pea seed, for these are the resting bodies (sclerotia) of the fungus that causes the disease. (Fig. 63.) The name of the fungus is *Sclerotium tuliparium*. The resting bodies, which take some finding until one is familiar with them, are firm but not hard: and when cut across or pinched open with the finger nail the interior is seen to be white or more often pinkish-white.

Having satisfied oneself about the presence of Grey Bulb Rot, several questions naturally arise. How did it get there, how does it spread, how long does it remain in the soil, what plants can safely be

grown in contaminated land, and how can the disease be eradicated or controlled? Unfortunately complete answers cannot yet be given to all these questions.

The most difficult one to answer is the first. It is generally assumed that the fungus is introduced into fresh soil with the bulb, and this is the most feasible explanation, although affected bulbs are usually so severely damaged that they are useless for planting purposes. Possibly resting sclerotia are occasionally present on the outer scales of otherwise healthy Tulip bulbs, or the fungus may be introduced with one of several other less susceptible bulb hosts. Whatever the true explanation, once the fungus gets into the soil it can remain alive there for at least three or four years in the absence of Tulips or other susceptible plants. As far as is known it does not produce spores and therefore the disease, unlike most fungus diseases, does not spread above ground from plant or place to place. It remains in the soil, but can of course be moved short distances when digging or ploughing, or longer distances when the sclerotia are carried in soil adhering to boots, spades, forks, cart wheels and the like. That is why an old patch gets larger each year, and why new small patches usually begin not far away from the old ones. Bulbous Irises are as susceptible as Tulips, and Grey Bulb Rot has also been found occasionally on Hyacinth, Narcissus, Colchicum, Crocus and Ixia. *Gladiolus*, *Dicentra* (*Dielytra*) *spectabilis*, *Scilla sibirica*, and *Fritillaria imperialis* are also said to be slightly susceptible.

The indirect or passive method of dealing with Grey Bulb Rot can be deduced from the facts given above. It is obviously useless to try and grow Tulips or bulbous Irises immediately in soil where the disease has occurred. The other plants mentioned are more resistant and might not suffer much, but their presence would suffice to keep the fungus alive in the soil, perhaps for many years. None of these plants, therefore, should be grown in contaminated soil for at least four years, at the end of which the fungus may be expected to have died from starvation. Other plants could be grown without risk. This passive method would naturally not prevent the transfer of contaminated soil during digging or on tools to other parts of the garden or field, where susceptible plants may be growing.

It is therefore best to adopt active measures to try to eradicate the fungus from the soil. A simple method, where the patches are quite small and the work is done very thoroughly, is to remove the soil to a depth of about a foot, discard it altogether, and replace with fresh soil. For these and rather larger areas it is possible to disinfect the soil after removing and burning as many diseased bulbs as can be found. Where steam sterilization of outdoor beds is a practical proposition, steaming for an hour completely eliminates the fungus. Failing this, chemicals can be used, though they may not be 100 per cent. effective. Formaldehyde, for example, has given good results when diluted with water. Mix one part of commercial (38 per cent.) formaldehyde with 49 parts of water and apply sufficient of the solution to the loosely dug patches to penetrate and wet the soil to a depth of 6–8 inches. One gallon of the diluted solution per sq. ft. should be ample unless the soil is very dry. This is about twice the amount normally recommended for ordinary soil sterilization and is necessary because the sclerotia of the fungus

are fairly resistant. It is advisable to cover the treated soil for 48 hours with sacking or other similar material drenched with the formaldehyde. Later, the ground should be lightly forked over, and planting with Tulips or other plants can then be safely carried out some four or five weeks after the treatment.

Good results have also been obtained with a fungicidal powder containing penta-chloro-nitro-benzene as its active agent. This powder is available on the market. In the open it should be thoroughly incorporated with the surface soil two or three weeks before planting the bulbs, using about 2 oz. per square yard. It is useless merely to sprinkle the powder on the surface of the soil.

Grey Bulb Rot can be avoided in forced bulbs by using steam sterilized soil in the boxes. If an attack does occur under glass it is essential to sterilize the soil before using it again, preferably by steam or alternatively with chemicals. If the penta-chloro-nitro-benzene powder is used it should be thoroughly mixed with the soil two or three weeks before planting, using 12-16 oz. per cubic yard of soil. New boxes should be obtained or the old ones disinfected. Those who plunge the boxes in ashes in the open before forcing should bear in mind that the sclerotia of the fungus can also remain viable in the ashes, and where an attack has occurred fresh clean ashes must be used the following year.

WISLEY TRIALS, 1949

ANTIRRHINUMS AT WISLEY, 1949

One hundred and forty stocks of Antirrhinums from seed were sent for trial in 1949. The seed was sown, under glass, on February 25, 1949, and the seedlings were planted out, where they were to flower, on May 4, 1949. The Dwarf Bedding and Tom Thumb varieties were planted in rows 15 inches apart; the Intermediate varieties were planted in rows 18 inches apart; the Majestics in rows 21 inches apart, the plants being spaced, in each case, 9 inches apart in the rows. The Tall varieties were spaced 12 inches apart in the rows, 24 inches separating the rows. Fifty plants of each stock were grown. The growth was good and the space available was covered by the plants by the time they were in flower in early July. The varieties had been grouped as far as possible in similar shades according to their types, which gave the opportunity of comparing the merits of closely related stocks. The trial was examined by a sub-committee of Floral "A" Committee on several occasions, who took into consideration when recommending awards the quality of the spike and of the individual flower, and also the trueness of the stocks grown. In no case was a stock containing more than a very small percentage of rogues recommended for an award.

In addition to the above, eight stocks of Antirrhinums claimed to be resistant to Rust Disease (*Puccinia antirrhini*) were sent for trial. These were judged by the sub-committee of Floral "A" Committee mainly on the basis of their true resistance to Rust Disease, as well as flower character and trueness of stock. Five stocks proved to be completely resistant and these were recommended for an Award of Merit as Rust-Resistant varieties. The varieties in question were ORANGE GLOW RUSTPROOF, RUST RESISTANT PINK,

WISLEY BRIDESMAID, WISLEY CHEERFUL and WISLEY GOLDEN FLEECE; these are grouped under their type and colour headings in the report. The number in brackets after the description of each stock is that under which each was grown in the trial.

HABIT DWARF, PROSTRATE

Magic Carpet (raised and introduced by Messrs. Watkins & Simpson, Ltd., and sent by Messrs. Carters Tested Seeds, Ltd., Raynes Park, London, S.W.20). **H.C.** July 6, 1949.—Of dwarf spreading habit, 4 inches high, flower spike short; flowers small of mixed colours. A true and even stock. Also sent by Messrs. Watkins & Simpson, Ltd., a less regular stock. (1, 2).

TOM THUMB VARIETIES

Snowflake (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of dwarf, bushy habit, 6 inches tall, with short flower spikes; flowers small, white. (3).

Canary Yellow (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of dwarf, bushy habit, 6 inches tall, with short flower spikes; flowers small, Sulphur Yellow (H.C.C. 1/1) with a cream tube and throat. (4).

BEDDING VARIETIES (NANUM COMPACTUM)

FLOWERS WHITE

White Reselected (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 6, 1949.—Plant of compact, bushy habit, 10 to 12 inches tall, with very narrow pointed foliage; flower spikes short; flowers small, pure white. A good even stock. (8).

FLOWERS YELLOW

The following variety was grown; CANARY YELLOW (Watkins & Simpson) (9).

FLOWERS AMBER

The following variety was grown: AMBER GEM (Watkins & Simpson) (10).

FLOWERS APRICOT

Apricot Queen (raised, introduced and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham 16). **A.M.** July 18, 1949.—Plant of dwarf bushy habit, 6 to 8 inches tall, with short compact flower spikes and medium-sized flowers, Apricot (H.C.C. 609/1) suffused with gold, tube white. A good even stock. (5).

FLOWERS OF PINK SHADES

Pinkie (sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** July 25, 1949.—Plant of dwarf, bushy habit, 7 or 8 inches tall, with short, compact flower spikes; flowers small, Neyron Rose (H.C.C. 623), tube white. Also sent by Messrs. Watkins & Simpson, Ltd., a less regular stock. (7, 6).

FLOWERS OF ROSE SHADES

Carmine Rose (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** August 4, 1949.—Plant of dwarf, bushy habit, 10 inches tall; flower spikes short, compact; flowers small, Rose Red (H.C.C. 724/2). (12).

The following variety was grown: RICH ROSE (Watkins & Simpson) (11), a mixed stock.

FLOWERS ORANGE-SCARLET

The following variety was grown: ORANGE SCARLET (Watkins & Simpson) (13), a mixed stock.

FLOWERS MAROON

Black Prince (raised and introduced by Messrs. Watkins & Simpson Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham 16). **H.C.** July 18, 1949.—Plant of compact, erect habit, 15 inches tall; flower spikes compact; foliage tinged bronzy-purple; flowers of medium size, Ruby Red (H.C.C. 827) flushed Indian Lake (H.C.C. 826). A true even stock. A dwarfer and more compact selection of this variety, and distinct from other senders. (86).

The following varieties were grown: BLACK PRINCE (Watkins & Simpson, Hurst) (87, 85); DARK CRIMSON (Watkins & Simpson) (14).

*INTERMEDIATE VARIETIES**FLOWERS WHITE*

Aphrodite (raised, introduced and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham 16). **A.M.** July 25, 1949.—Plant of compact, bushy habit, 18 inches tall; flower spikes long, compact; flowers large, white. The largest flowered white in this section. (19).

White Queen (raised and introduced by Messrs. Watkins & Simpson, Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham 16). **H.C.** July 6, 1949.—Plant of compact erect habit, 16 inches tall; flower spikes of medium length; flowers of medium size, white, some with a greenish-yellow lip. (16).

The following varieties were grown: INTERMEDIATE WHITE (Carters) (18); WHITE WONDER (Hurst) (15).

FLOWERS OF YELLOW SHADES

Wisley Golden Fleece (raised at Wisley by Mr. D. E. Green, M.Sc., and included in the trial by the Director). **A.M.** July 25, 1949, as a rust-resistant variety.—Plant of compact habit, 16 inches tall; flower spikes of medium length, compact, flowers of medium size, Sulphur Yellow (H.C.C. 1/1); tube white. (88).

Yellow Beauty (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 25, 1949.—Plant of bushy, erect habit, 18 inches tall; flower spikes long, compact; flowers large, Primrose Yellow (H.C.C. 601); tube cream; late flowering. (21).

Golden Queen Reselected (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 25, 1949.—Plant of compact, bushy habit, 16 inches tall; flower spikes of medium length; flowers of medium size, Sulphur Yellow (H.C.C. 1/1); tube yellow. (24).

Intermediate Yellow (raised, introduced and sent by Messrs. Carters Tested Seeds, Ltd., Raynes Park, London, S.W.20). **H.C.** July 18, 1949.—Plant of compact, bushy habit, 20 inches tall; flower spikes long, compact; flowers of medium size. Sulphur Yellow (H.C.C. 1); tube cream. (22).

Jaune Supreme (raised, introduced and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** July 18, 1949.—Plant of compact, bushy habit, 18 inches tall; flower spikes long, compact; flowers of medium size. Sulphur Yellow (H.C.C. 1); lip touched gold; tube cream. (20).

The following variety was grown: GOLDEN GEM (W. H. Simpson) (23).

FLOWERS AMBER SHADES

Amber Queen (raised and introduced by Messrs. Watkins & Simpson, Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road,

Birmingham). **H.C.** July 18, 1949.—Plant of compact habit, 12 inches tall; flower spikes short, very compact; flowers small, upper lobe Marigold Orange (H.C.C. 11/2) flushed gold, lower tube Canary Yellow (H.C.C. 2/1) tinged orange; tube white; lip golden-amber. (25). Also sent by Messrs. Watkins & Simpson, Ltd., a less regular stock. (26).

The following variety was grown: **QUEEN OF THE NORTH** (Hurst) (17).

FLOWERS CREAM SHADED ORANGE

The following variety was grown: **PSYCHE** (Daehnfeldt) (27), variable in shade.

FLOWERS OF PINKISH-AMBER SHADES

Picture (raised, introduced and sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.). **A.M.** July 18, 1949.—Plant of compact, bushy habit, 18 inches tall; flower spikes long, compact; flowers of medium size, Apricot (H.C.C. 609/1) flushed gold; tube white; lip yellow. (29). Also sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2, whose strain of this variety was **Highly Commended**. (28).

Glint of Gold (raised, introduced and sent by Messrs. Nutting & Sons, Ltd., Merstham, Surrey). **H.C.** July 18, 1949.—Plant of compact habit, 15 inches tall; flower spikes of medium length; flowers of medium size. Shrimp Red (H.C.C. 616/1) flushed gold; tube white. (31).

Prima Donna (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of compact, erect habit, 18 inches tall; flower spikes long; flowers of medium size. Azalea Pink (H.C.C. 618) suffused with Chinese Coral (H.C.C. 614/1) with a golden-apricot sheen; tube white. (57).

FLOWERS WHITE FLUSHED ROSE

The following variety was grown: **IRMELIN ROSE** (Daehnfeldt), varies in shade (30).

FLOWERS PALE PINK SHADES

Cottage Maid (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 25, 1949.—Plant of compact, bushy habit, 18 inches tall; flower spikes compact, of medium length; flowers of medium size, Rose Pink (H.C.C. 422); tube white. (33).

The following variety was grown: **ENCHANTRESS** (Watkins & Simpson) (32).

FLOWERS OF PINK SHADES

Roseum Superbum (raised and introduced by Messrs. Watkins & Simpson and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **A.M.** July 25, 1949.—Plant of compact habit, 20 inches tall; flower spikes of medium length; flowers of medium size, Neyron Rose (H.C.C. 623) self. (41).

Rust Resistant Pink (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** August 4, 1949, as a rust-resistant variety.—Plant of dense, bushy habit, 22 inches tall; flower spikes long; flowers large, Rose Pink (H.C.C. 427) flushed with Neyron Rose (H.C.C. 623/3) self. (89).

Wisley Bridesmaid (raised at Wisley by Mr. D. E. Green, M.Sc., and included in the trial by the Director). **A.M.** July 18, 1949, as a rust-resistant variety.—Plant of compact, bushy habit, flower spikes long; flowers of medium size, Phlox Pink (H.C.C. 625/1) self. (90).

Charm (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18 1949.—Plant of bushy habit, 16 inches tall; flower spikes of medium length;

flowers of medium size, Phlox Pink (H.C.C. 625/1) flushed Neyron Rose (H.C.C. 623/1) self. (43).

Nelrose (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2, also sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.3). **H.C.** July 25, 1949.—Plant of erect, bushy habit, 20 inches tall; flower spikes of medium length; flowers of medium size. Neyron Rose (H.C.C. 623) self. (40, 39).

Malmaison (raised, introduced and sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.3, also sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** July 25, 1949.—Plant of erect, bushy habit, 22 inches tall; flower spikes long, strong; flowers Neyron Rose (H.C.C. 623/1) flushed Phlox Pink (H.C.C. 625/1) self. (36, 38). Also sent by Messrs. Watkins & Simpson, Ltd., a less regular stock. (37).

The following varieties were grown: **FASCINATION** (Watkins & Simpson, W. H. Simpson) (34, 35); **ROSE SENSATION** (W. H. Simpson) (91).

FLOWERS SALMON PINK SHADES

Harmony (sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of compact habit, 24 inches tall; flower spikes long; flowers large, Carmine Rose (H.C.C. 621) suffused with Begonia (H.C.C. 619), margins of lower lobe Amber Yellow (H.C.C. 505). (95). Also sent by Messrs. W. H. Simpson & Sons, a variable stock. (96).

FLOWERS SALMON ROSE

Beacon (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** August 4, 1949.—Plant of compact, bushy habit, 18 inches tall; flower spikes of medium length; flowers of medium size, Neyron Rose (H.C.C. 623) flushed with golden-orange. (42).

FLOWERS OF ROSE SHADES

Gloria (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 25, 1949;—Plant of compact, bushy habit, 18 inches tall; flower spikes of medium length. flowers of medium size, Rose Madder (H.C.C. 23/1) self. (49).

Rose Eclipse (raised and introduced by Messrs. Hurst & Son, Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **A.M.** July 25, 1939.—Plant of bushy habit, 20 inches tall; flower spikes long; flowers of medium size, Phlox Pink (H.C.C. 625/1). (47).

Wisley Cheerful (raised at Wisley by Mr. D. E. Green, M.Sc., and included in the trial by the Director). **A.M.** July 25, 1949, as a rust-resistant variety.—Plant of dwarf bushy habit, 14 inches tall; flower spikes short; flowers small, Phlox Pink (H.C.C. between 625 and 625/1) with a golden sheen. (92).

Rose Dore (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd, 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 6, 1949.—Plant of compact, erect habit, 16 inches tall; flower spikes of medium length; flowers small, Rose Red (H.C.C. 724/1) self. (50).

Royal Rose (raised, introduced and sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.3, also sent by Messrs. Watkins & Simpson, 27 Drury Lane, Covent Garden, London, W.C.2, who share the award). **H.C.** July 25, 1949.—Plant of erect, bushy habit, 20 inches tall; flower spikes long; flowers large, Rose Madder (H.C.C. 23/1) self. (44, 45). Also sent by Messrs. W. H. Simpson & Sons, a much paler selection. (46).

The following variety was grown; **ROSE ECLIPSE** (Hurst) (48).

FLOWERS ROSY MAUVE

The following variety was grown: **MAUVE BEAUTY** (Watkins & Simpson) (51).

FLOWERS CHERRY-RED SHADES

Radiance (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 6, 1949.—Plant of very compact, bushy habit, 15 inches tall; flower spikes short; flowers of medium size. Scarlet (H.C.C. 19/1) showing a Carmine (H.C.C. 21/1) reverse, with an orange sheen. (54).

The following varieties were grown: **CHERRY RIPE** (Watkins & Simpson) (52); **LUMINANT** (Sharpe) (53).

FLOWERS OLD ROSE

Strawberry Gleam (raised, introduced and sent by Messrs. Charles Sharpe & Co., Ltd., Sleaford, Lincs.). **H.C.** July 25, 1949.—Plant of very compact, bushy habit, 20 inches tall; flower spikes of medium length; flowers medium size, Jasper Red (H.C.C. 018/1) suffused with bright russet orange. (55).

FLOWERS OF SALMON-ORANGE SHADES

Victory (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2, also sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.3, whose stock shares the Award). **A.M.** July 25, 1949.—Plant of erect, bushy habit, 20 inches tall; flower spikes long; flowers large, Azalea Pink (H.C.C. 618) suffused with Chinese Coral (H.C.C. 6/4); lip blotched golden-orange. (59, 58).

La Victoire (raised, introduced and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** July 18, 1949.—Plant of compact, erect habit, 22 inches tall; flower spikes long; flowers large, Azalea Pink. (H.C.C. 618) suffused with Shrimp Red (H.C.C. 616); lip blotched golden-orange. (60).

The following variety was grown: **ST. GEORGE** (Watkins & Simpson, W. H. Simpson) (56, 63).

FLOWERS OF ORANGE SHADES

Dorothy Silk (raised, introduced and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **A.M.** August 4, 1949.—Plant of bushy habit, 22 inches tall; flower spikes long; flowers of medium size, Indian Orange (H.C.C. 713); tube white. (64).

Orange Glow. Rustproof (raised, introduced and sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.3). **A.M.** August 4, 1949, as a rust resistant variety. Plant very compact, 18 inches tall; flower spikes of medium length; flowers of medium size. Marigold Orange (H.C.C. 11), tube rose-carmine. (93).

Bonfire (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of bushy habit, 18 inches tall; flower spikes long; flowers of medium size. Fire Red (H.C.C. 15), lower lobe suffused with orange. (66).

Orange Glow (raised and introduced by Messrs. Hurst & Son, Ltd., and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of bushy habit, 16 inches tall; flower spikes of medium length; flowers of medium size. Marigold Orange (H.C.C. 11/1) on a base of Nasturtium Orange (H.C.C. 14/2) with a golden sheen. (61).

The following varieties were grown: **ORANGE GLOW** (Hurst) (62); **ORANGE SUPREME** (W. H. Simpson) (65).

FLOWERS OF SCARLET SHADES

Advance (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of bushy habit, 16 inches tall; flower spikes of medium length; flowers of medium size, Dutch Vermilion (H.C.C. 717); tube white. (70).

Flame (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of compact, erect habit, 20 inches tall; flower spikes long; flowers large, Signal Red (H.C.C. 719); tube rose. (71).

His Excellency (raised, introduced and sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.3). **H.C.** July 25, 1949.—Plant of bushy, compact habit, 18 inches tall; flower spikes of medium length; flowers of medium size. Opening Orient Red (H.C.C. 819) passing to Signal Red (H.C.C. 719) self. (76).

Scarlet Triumph (sent by Messrs. L. Daehnfeldt, Ltd., Odense, Denmark). **H.C.** July 25, 1949.—Plant of compact habit, 20 inches tall; flower spikes of medium length; flowers of medium size. Signal Red (H.C.C. 719) with a sheen of Dutch Vermilion (H.C.C. 717). (73).

Vesuvius (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of compact, erect habit, 18 inches tall; flower spikes of medium length; flowers of medium size. Dutch Vermilion, lower lobe shaded with gold. (67).

The following varieties were grown: **AFTERGLOW** (W. H. Simpson) (74); **BEDDING SCARLET** (W. H. Simpson) (72); **DAZZLER** (Watkins & Simpson) (69); **FIRE KING** (W. H. Simpson) (77); **FILRY BELI** (Watkins & Simpson) (68); **SCARLET SUPREME** (W. H. Simpson) (75).

FLOWERS OF CRIMSON SHADES

Crimson Velvet (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 25, 1949.—Plant of bushy habit, 18 inches tall; flower spikes long, full; flowers very large, Currant Red (H.C.C. 821) with a sheen of Blood Red (H.C.C. 820). (78).

Welcome (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 25, 1949.—Plant of bushy habit, 20 inches tall; flower spikes of medium length; flowers large, Chrysanthemum Crimson (H.C.C. 824) suffused with Cardinal Red (H.C.C. 822), lower lobe gold. (82).

Eclipse (raised and introduced by Messrs. Hurst & Son, Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** July 18, 1949.—Plant of compact, bushy habit, 20 inches tall; flower spikes of medium length; flowers large. Currant Red (H.C.C. 821) flushed Blood Red (H.C.C. 820), with dark bronzy foliage. (79).

Red Emperor (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of compact habit, 18 inches tall; flower spikes of medium length; flowers large. Blood Red (H.C.C. 820) on a Currant Red (H.C.C. 821) ground. (83).

The following varieties were grown: **ECLIPSE** (Hurst) (80); **WELCOME** (Hurst) (81).

FLOWERS CRIMSON AND YELLOW

The following variety was grown: **MEFISTO** (Daehnfeldt) (84).

FLOWERS MAROON

The following variety was grown: **RED ROCKET** (Simpson) (94).

*MAJESTIC VARIETIES**FLOWERS WHITE*

Avalanche (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 18, 1949.—Plant of compact habit, 18 inches tall; flower spikes long; flowers large, white, with a creamy-white lip; a good regular stock (97).

FLOWERS YELLOW

Eldorado (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 25, 1949.—Plant of compact habit, 20 inches tall; flower spikes of medium length; flowers large. Sulphur Yellow (H.C.C. 1/1), tube creamy-white, lip blotched with Aureolin (H.C.C. 2). (98).

FLOWERS APRICOT

Twilight (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** August 4, 1949.—Plant of compact habit, 20 inches tall; flower spikes long; flowers large, upper lobe Apricot (H.C.C. 609/2) heavily suffused with Lemon Yellow (H.C.C. 4/1), lower lobe Lemon Yellow (H.C.C. 4/1); tube Azalea Pink (H.C.C. 618/2). (99).

FLOWERS OF PINK SHADES

The following varieties were grown: **FAIR LADY** (Watkins & Simpson) (100); **ROSELLA IMPROVED** (W. H. Simpson) (101).

FLOWERS OF SALMON-PINK SHADES

Delight (raised by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 18, 1949.—Plant of bushy habit, 22 inches tall; flower spikes long; flowers very large, Azalea Pink (H.C.C. 618/1) suffused with Chinese Coral (H.C.C. 614/1), lip blotched golden-yellow. (102).

Evensong (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 25, 1949.—Plant of bushy habit, 22 inches tall; flower spikes long; flowers extra large, Azalea Pink (H.C.C. 618/1) suffused Chinese Coral (H.C.C. 614/1), lip blotched Amber Yellow (H.C.C. 505). (103).

Sunset (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 18, 1949.—Plant of compact, bushy habit, 22 inches tall; flower spikes long; flowers large, Porcelain Rose (H.C.C. 620) heavily suffused with Azalea Pink (H.C.C. 618). (110).

FLOWERS OF ROSE SHADES

Rose Princess (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 6, 1949.—Plant of erect, bushy habit, 22 inches tall; flower spikes long; flowers very large. Carmine Rose (H.C.C. 621) suffused with Begonia (H.C.C. 619/1). (106).

Splendour (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of compact habit, 24 inches tall; flower spikes long; flowers large. Carmine (H.C.C. 21) heavily suffused with Vermilion (H.C.C. 18/1). (104).

The following varieties were grown: **ROSAMOND** (Watkins & Simpson), a variable stock (107); **ROSE MARIE** (Watkins & Simpson), a mixed stock (105).

FLOWERS OF CHERRY RED SHADES

Startler (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 25, 1949.—Plant of compact, erect habit, 20 inches tall; flower spikes long, flowers large, Cherry Red (H.C.C. 722/1) slightly flushed with Scarlet (H.C.C. 19/1). (108).

The following variety was grown: **FIRE DRAGON** (W. H. Simpson), distinct from that of other senders (112).

FLOWERS OF ORANGE SHADES

Orange King (raised and introduced by Messrs. Watkins & Simpson, Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** August 4, 1949.—Plant of compact habit, 22 inches tall; flower spikes long; flowers large, Indian Orange (H.C.C. 713), lip Buttercup Yellow (H.C.C. 5). (109). Also sent by Messrs. Watkins & Simpson, Ltd., a less regular stock. (114).

The following variety was grown: **GOLDEN DAWN** (Watkins & Simpson) (113).

FLOWERS SCARLET

Fire Dragon (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of erect, compact habit, 20 inches tall; flower spikes of medium length; flowers large, Signal Red (H.C.C. 719) self. (111). Distinct from 'Fire Dragon' of Messrs. W. H. Simpson & Sons.

FLOWERS CRIMSON

Red Chief (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 25, 1949.—Plant of erect, very compact habit, 18 inches tall; flower spikes of medium length; flowers large, Currant Red (H.C.C. 821/1) shaded Blood Red (H.C.C. 820) self. (115).

FLOWERS OF PURPLE SHADES

Purple King (raised and introduced by Messrs. Watkins & Simpson, Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **A.M.** July 6, 1949.—Plant of compact, erect habit, 20 inches tall; flower spikes long; flowers large, Peony Purple (H.C.C. 729/1) flushed with Tyrian Purple (H.C.C. 727). (117). Also sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2, whose stock of this variety, which was somewhat paler in colour was **Highly Commended**. (116).

*TALL VARIETIES, WITH SINGLE FLOWERS**FLOWERS YELLOW*

The following variety was grown: **YELLOW KING** (Watkins & Simpson, W. H. Simpson) (121, 122).

FLOWERS OF AMBER SHADES

The following varieties were grown: **AMOR** (Daehnfeldt) (123); **C. H. HERBERT** (W. H. Simpson) (124); **GOLIATH** (Watkins & Simpson) (127).

FLOWERS ORANGE

The following variety was grown: **ORANGE GLORY** (Watkins & Simpson) (125).

FLOWERS OF PINK SHADES

Feltham Beauty (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 6, 1949.—Plant of erect habit, 28 inches tall; flower spikes long, tapering,

full; flowers large, Phlox Pink (H.C.C. 625/1) flushed Neyron Rose (H.C.C. 623/1); tube pinkish white. (130).

The following varieties were grown: PRINCESS ELIZABETH (W. H. Simpson) (129) ROSE FAIRY (Burpee) (131).

FLOWERS WHITE SHADED ROSE

The following variety was grown: PIERETTE (Daehnfeldt) (128).

FLOWERS APRICOT

The following variety was grown: APRICOT BEAUTY (Watkins & Simpson) (126).

FLOWERS OF SCARLET SHADES

The following varieties were grown: BONFIRE (Watkins & Simpson) (133); HUNTS-MAN (W. H. Simpson) (135); KING (W. H. Simpson) (134).

FLOWERS OF CRIMSON SHADES

Crimson Giant (raised, introduced and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). H.C. July 6, 1949.—Plant of compact, erect habit, 28 inches tall; flower spikes full, long; flowers large, bright Currant Red (H.C.C. 821) shaded Blood Red (H.C.C. 820) self. (137).

The following varieties were grown: CRIMSON KING (Watkins & Simpson) (136); MONARCH (Hurst) (132).

FLOWERS OF MIXED COLOURS

The following varieties were grown: GIANT SKYSCRAPER (Burpee) (138); TETRA MIXED (Burpee), a tetraploid variety (139); TETRAPLOID MIXED (Bodger) (140).

TALL VARIETIES WITH SO-CALLED DOUBLE FLOWERS

FLOWERS OF YELLOW SHADES

Burpee Double (raised, introduced and sent by Messrs. Atlee Burpee Co., Philadelphia, U.S.A.). A.M. July 25, 1949, as a variety for cutting and market.—Plant of erect habit, 28 inches tall; flower spikes stout, very long, full; flowers large, have extra petals, giving a double appearance, Sulphur Yellow (H.C.C. 1/1); tube French Rose (H.C.C. 520/1). (118).

Floradale Double (raised, introduced and sent by Messrs. W. Atlee Burpee Co., Philadelphia, U.S.A.). A.M. July 25, 1949, as a variety for cutting and market.—Plant of erect habit, 26 inches tall, flower stems stout, very long, full; flowers large, have extra petals, giving a double appearance, Sulphur Yellow (H.C.C. 1/1); tube shaded rose. (120).

Lemonade (raised, introduced and sent by Messrs. W. Atlee Burpee Co., Philadelphia, U.S.A.). H.C. July 25, 1949, as a variety for cutting and market.—Plant of erect habit, 32 inches tall; flower spikes very long, stout, full; flowers have extra petals, giving a double appearance, large, Primrose Yellow (H.C.C. 601/1) tinted with Canary Yellow (H.C.C. 2); tube white. (119).

EARLY FLOWERING CHRYSANTHEMUMS AT WISLEY, 1949

One hundred and twenty-nine varieties were grown at Wisley in 1949. Of these fifty-three were grown for the first time, having been selected for trial in 1948 by the Joint Committee of the Royal Horticultural Society and the National Chrysanthemum Society.

All the varieties, including the new seedlings, were given the warm-water treatment as a precaution against Eelworm attack.

The rooted cuttings, three of each variety of the spray varieties, twelve of the disbudded varieties, were planted on a fresh site on May 9, 1949. The plants were stopped once, with the exception of the spray varieties; they were disbudded, one flower being allowed to develop on each main growth.

The report indicates the present state of the trials, showing those varieties retained for future judgment and those deleted from the trials.

The trial was inspected by the Joint Committee on August 19, September 7 and 27, 1949, who made their recommendations for Awards as given below.

FLOWERS WHITE

White Bouquet (raised, introduced and sent by Messrs. H. Shoesmith, Ltd., Mayford, Woking, Surrey). **F.C.C.** September 27, 1949.—Described **R.H.S. JOURNAL 71**, p. 49. (**A.M.** 1945.)

Cotswold Gem (raised by Mr. W. Avery, introduced and sent by Messrs. Greenyer Bros., Ltd., Broadwinter Green Nurseries, Worthing, Sussex). **A.M.** September 7, 1949, as a spray variety for cutting and garden decoration.—2½ feet; flower stems 15 inches long. Flowers double, 3½ inches diameter, reflexed, pure white.

Snow Queen (raised, introduced and sent by Messrs. H. Shoesmith, Ltd., Mayford, Woking, Surrey). **A.M.** September 27, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of bushy habit with 24 inch flower stems. Flowers double, incurved, 5 inches diameter, milky-white, solid.

The following varieties have been retained for future judgment: **ALIRETON IVORY** (Riley), **SWAN** (Shoesmith).

The following varieties have been deleted from the trials: **ALPINE**, **MARION** (**A.M.** 1947), **MILLERSDALE** (**A.M.** 1946).

FLOWERS CREAM

Hallmark (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). **A.M.** September 7, 1949, as a disbudded variety for cutting and garden decoration.—3½ feet. Plant of compact, erect habit with 28 inch long flower stems. Flowers double, reflexed, creamy-white, inner florets deep cream.

Nymph (raised by Messrs. H. Shoesmith, Ltd., introduced and sent by Messrs. Napiers, Stepwater Nurseries, Ltd., Taunton, Somerset). **A.M.** September 7, 1949, as a spray pompon variety for cutting and garden decoration.—2 feet. Plant of compact, bushy habit, with 12 inch long flower stems. Flowers 1½ inch diameter, double, white, inner florets cream tinged golden-yellow.

The following variety has been deleted from the trials: **SHIRLEY CREAM** (**A.M.** 1947) syn. **CLIFFORD BUCKLEY**.

FLOWERS YELLOW

Golden Surprise (raised by Messrs. H. Shoesmith, Ltd., introduced and sent by Mr. W. B. Jackson, Brown Heath Nurseries, Waverton, Chester). **A.M.** September 27, 1949, as a disbudded variety for cutting and garden decoration.—3½ feet. Plant of compact, erect habit with 24 inch flower stems. Flowers double, reflexed, 5 inches diameter, deep bright lemon-yellow flushed Buttercup Yellow (**H.C.C.** 5).

Phase (raised by Messrs. H. Shoesmith, Ltd., introduced and sent by Messrs. Greenyer Bros., Ltd., Broadwater Green Nurseries, Worthing, Sussex). **A.M.** September 27, 1949, as a disbudded variety for cutting and garden decoration.—3½ feet. Plant of erect habit with 24 inch long flower stems. Flowers double, reflexed, 5 inches diameter, Aureolin (**H.C.C.** 3) overlaid with Lemon Yellow (**H.C.C.** 4).

Primrose Empire (sport from 'Empire White,' sent by Mr. W. B. Jackson, Brown Heath Nurseries, Waverton, Chester). **A.M.** September 27, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of compact, bushy habit with 26 inch long flower stems. Flowers

double, reflexed, $5\frac{1}{2}$ inches diameter, Empire Yellow (H.C.C. 603/2) inner florets flushed with Aureolin (H.C.C. 3/2).

The following varieties have been retained for future judgment: **GOLDEN CROSSLEY** (Johnson), **INTENSE** (Shoesmith), **MAGIC** (Shoesmith), **WHARFEDALE YELLOW** (Simpson).

The following varieties have been deleted from the trials: **ALFRETON YELLOW** (A.M. 1947), **FLAVIUS** (A.M. 1947), **GOLDEN HARVEST**, **SUNSHINE**.

FLOWERS OF AMBER SHADES

Gold of Ophir (raised by Messrs. Batchelors, Knaresborough, introduced and sent by Mr. R. Thistlewaite, Fair Lane Nursery, Bell Bar, Hatfield, Herts.) A.M. September 7, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of compact, bushy habit with 24 inch long flower stems. Flowers double, reflexed, $4\frac{3}{4}$ inches diameter, Buttercup Yellow (H.C.C. 5/1) suffused with deep golden-amber.

The following have been retained for future judgment: **ORANGE LOVELACE** (Johnson).

The following varieties have been deleted from the trials: **DOLLARS**, **GOLDENBLOOM** (A.M. 1947), **RADAR** (F.C.C. 1947).

FLOWERS WHITE FLUSHED ROSE

The following variety has been deleted from the trials: **NEW CRUSADER**.

FLOWERS OF PINK SHADES

Fair Maid (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). F.C.C. August 19, 1949, as a disbudded variety for cutting and garden decoration.—Described R.H.S. JOURNAL 72, p. 204. (A.M. 1946).

Pearl Sweetheart syn. **Lily Lambert Sweetheart** (introduced and sent by Mr. C. P. Ward, Bridge Bank, Walton-le-Dale, Preston, Lancs.) F.C.C. August 19, 1949, as a disbudded variety for cutting and garden decoration.—Described R.H.S. JOURNAL 73, p. 124 (A.M. 1947).

Day Dream (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). A.M. September 7, 1949, as a disbudded variety for cutting and garden decoration.—Described R.H.S. JOURNAL 73, p. 124. (H.C. 1947).

Tibshelf Shell (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). A.M. August 19, 1949, as a disbudded variety for cutting and garden decoration.— $2\frac{3}{4}$ feet. Plants of compact, bushy habit, with 24 inch long flower stems. Flowers double, reflexed, $4\frac{3}{4}$ inches diameter, opening Shrimp Red (H.C.C. 616/3) and passing to Venetian Pink (H.C.C. 420/1) with a pale creamy gold reverse.

The following varieties have been deleted from the trials: **BRIDESMAID** (A.M. 1943), **HYDE** (A.M. 1947), **SHELL BOUQUET** (A.M. 1946).

FLOWERS OF ROSE SHADES

Ladybower (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). A.M. August 19, 1949, as a disbudded variety for cutting and garden decoration.— $2\frac{3}{4}$ feet. Plant of compact habit with 22 inch long flower stems. Flowers double, reflexed, 5 inches diameter, Rhodamine Pink (H.C.C. 527) with a silvery-white reverse.

Patricia (raised, introduced and sent by Mr. H. Lowe, Vicar Lane Nurseries, Tibshelf, Derbyshire). A.M. September 7, 1949, as a disbudded variety for cutting and garden decoration.—Plant $2\frac{1}{2}$ feet tall, of compact, bushy habit with 20 inch long flower stems. Flowers double, reflexed, 4 inches diameter, Rhodamine Pink (H.C.C. 527/1) with a creamy-pink reverse.

The following varieties have been retained for future judgment: CAROL (Johnson), FONDANT (Johnson), LADY GAY (Johnson), MAYFORD PINK (Shoesmith), PINK UNA (Dixon).

The following varieties have been deleted from the trials: ANSOM, BARBARA (F.C.C. 1947), CHOICE, ROSELIGHT, ROYAL PINK.

FLOWERS OF ROSY-MAUVE SHADES

Hope Valley (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). **A.M.** August 19, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of compact, erect habit, with 26 inch long flower stems. Flowers double, reflexed, 6½ inches diameter, Amaranth Rose (H.C.C. 530/1) passing with age to 530/3), reverse, silvery-white.

Mauve Princess (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). **A.M.** September 7, 1949, as a disbudded variety for cutting and garden decoration.—3½ feet. Plant of compact, erect habit with 24 to 30 inch flower stems. Flowers double, reflexed, 5½ inches diameter, Mallow Purple (H.C.C. 630/1) on a Cyclamen Purple (H.C.C. 30/2) ground; reverse pale silvery-pink.

The following variety has been deleted from the trials: EMPRESS.

FLOWERS OF SALMON SHADES

Peach Una (sport from 'Una,' introduced by Mr. C. F. Tansey and sent by Mr. H. Woolman, Sandy Hill Nurseries, Shirley nr. Birmingham). **A.M.** September 27, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of compact, erect habit with 24 inch flower stems. Flowers double, incurved, 5½ inches diameter, soft rosy-salmon with a creamy-golden reverse.

Salmon Lovelace (sport from 'Lovelace,' introduced by Messrs. J. & T. Johnson and sent by Colham Green Nurseries, Ltd., Hillingdon, Middlesex). **A.M.** August 19, 1949.—2½ feet. Plant of compact, erect habit with 24 inch long flower stems. Flowers double, reflexed, 5 inches diameter, Egyptian Buff (H.C.C. 407) flushed with soft salmon-pink, reverse soft gold.

The following varieties have been retained for future judgment: SALMON BRONZE UNA (Bacon), SALMON UNA (Letch).

FLOWERS OF ORANGE-BRONZE SHADES

Bronze Marie syn. **Bronze Dallas** (sport from 'Marie,' introduced and sent by Mr. P. J. Gilleran, The Lodge, Darland Hall, Rossett, nr. Wrexham). **A.M.** August 19, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of compact, bushy habit with 22 inch long flower stems. Flowers double, reflexed, 6 inches diameter, dull old gold overlaid with Brick Red (H.C.C. 016/1) with a gold reverse.

The following variety has been retained for future judgment: BRONZE UNA (Jackson).

The following varieties have been deleted from the trials: CRESSET, MAYFORD ORANGE.

FLOWERS OF RED-BRONZE SHADES

The following variety has been retained for future judgment: BRONZE McLEOD (Colham Green Nurseries).

The following varieties have been deleted from the trials: BRONZE BARBARA, CHALLENGER, COPPELIA (**A.M.** 1940), PRELUDE.

FLOWERS OF RED SHADES

Cavalier (raised, introduced and sent by Mr. E. Riley, Brookside Nurseries, Alfreton, Derbyshire). **A.M.** August 19, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of compact, bushy habit with 24 inch long flower stems. Flowers double, reflexed, 5½ inches

diameter, bright reddish-bronze flushed Brick Red (H.C.C. 016) with a gold reverse.

Red McLeod (sport from 'George McLeod,' sent by Colham Green Nurseries, Ltd., Hillingdon, Middlesex). **A.M.** September 27, 1949, as a disbudded variety for cutting and garden decoration.— $3\frac{3}{4}$ feet. Plant of erect habit with 28 inch long flower stems. Flowers double, incurved, 6 inches diameter, deep rich chestnut-red with a deep gold reverse.

The following varieties have been retained for future judgment: **CRIMSON WONDER** (Shoesmith), **MERLIN** (Shoesmith), **RED CAESAR** (Woolman), **RED ZENITH** (Denton), **REVENGE** (Shoesmith).

The following varieties have been deleted from the trials: **GLADIATOR** (**F.C.C.** 1944), **HURRICANE** (**A.M.** 1945), **TEMPEST VULCAN** (**A.M.** 1939).

FLOWERS OF PURPLE SHADES

Alfreton Yeoman (raised, introduced and sent by Mr. E. Riley, Brookside Nurseries, Alfreton, Derbyshire). **A.M.** September 7, 1949, as a disbudded variety for cutting and garden decoration.— $3\frac{1}{2}$ feet. Plant of compact bushy habit with 30 inch long flower stems. Flowers double, reflexed, 5 inches diameter, Rhodamine Purple (H.C.C. between 29 and 29/1), inner florets Fuchsia Purple (H.C.C. 28) with a silvery-pink reverse.

The following varieties have been retained for future judgment: **BLenheim GEM** (Shoesmith), **INCURVED ZENITH** (Jackson).

The following variety has been deleted from the trials: **ROWSLEY**.

DAHLIAS AT WISLEY, 1949

Two hundred and sixty varieties of Dahlias were grown in the trial at Wisley. Of these, ninety-eight were grown for the first time, having been selected for trial by the Joint Committee of the Royal Horticultural Society and the National Dahlia Society; the remainder were grown for future judgment or comparison, most of which had received awards in previous years.

The report indicates the classes to which the new varieties have been assigned and those retained for future judgment as well as the varieties which have been deleted from the trials.

The trial was inspected by the Joint Committee on August 18 and September 8, 1949, who made their recommendations for Awards as given below. The names in brackets following the variety denote the raiser, where known.

CLASS III—ANEMONE-FLOWERED

Vera Higgins (raised, introduced and sent by Messrs. J. G. Ballego & Sons, Leiden, Holland). **H.C.** August 18, 1949.— $3\frac{1}{4}$ feet. Plant of bushy habit. Flowers $4\frac{1}{4}$ inches diameter, ray florets. Terra-cotta Bronze, disc florets golden-yellow suffused reddish-bronze; free and erect, on 8 inch wiry stems, well above the foliage.

CLASS IVa—COLLERETTE SINGLE

The following varieties have been deleted from the trials: **LADY KINDERSLEY**, **MRS. O. M. COURAGE**.

CLASS Vc—SMALL PAEONY-FLOWERED

Morning Glow (raised, introduced and sent by Messrs. J. Cheal & Sons, Ltd., Lowfield Nurseries, Crawley, Sussex). **A.M.** September 8, 1949.—Described **R.H.S. JOURNAL** 73, p. 221. (**H.C.** 1947).

CLASS VIa—GIANT FLOWERED DECORATIVE

John Busbridge (raised, introduced and sent by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea). **A.M.** September 8, 1949.—Described **R.H.S. JOURNAL** 73, p. 223. (**H.C.** 1947).

Phoebe Mays (raised, introduced and sent by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea) **H.C.** September 8, 1949.—3 feet. Flowers 10½ inches diameter, Spanish Orange (H.C.C. 010) tinged Mars Orange (H.C.C. 013); free and erect on 12 to 14 inch stalks, well above the foliage.

The following varieties have been retained for future judgment: ANNA BENEDICT (Ogg), MARGARET COLVIN (Stredwick), WINIFRED STREDWICK (Stredwick).

The following variety has been deleted from the trials: LAVENDER PERFECTION.

CLASS VIb—LARGE FLOWERED DECORATIVE

Justinus Kerner (raised by Mr. V. Berger and sent by Messrs. J. F. Spencer & Son, Hockley, Essex). **A.M.** September 8, 1949.—Described R.H.S. JOURNAL 73, p. 224. (**H.C.** 1947).

Rosanna (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks.). **A.M.** August 18, 1949.—4½ feet. Flowers 9 inches diameter, Phlox Pink (H.C.C. 625) heavily overlaid with salmon-apricot; free and erect, on 8 to 12 inch stalks, well above the foliage.

Bess Smith (of American origin, introduced and sent by Mr. A. T. Barnes, 13 Cardington Road, Bedford). **H.C.** September 8, 1949.—5 feet. Flowers 9 inches diameter, white, inner florets cream; free and erect, on 12 inch stalks well above the foliage.

Cease Fire (raised, introduced and sent by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea). **H.C.** August 18, 1949.—5 feet. Flowers 8 to 9 inches diameter, Primrose Yellow (H.C.C. 601 fading to 601/3 at tips of florets); free and erect, on 12 inch stalks, above the foliage.

White Guard (raised, introduced and sent by Messrs. J. F. Spencer & Son, Ltd., Hockley, Essex). **H.C.** August 18, 1949.—3½ feet. Flowers 9½ inches diameter, white tinted cream; free and erect, on 7 to 9 inch stalks, well above the foliage.

The following varieties have been retained for future judgment: EILEEN QUINNELL (Stredwick), FRANK K. DOWDEN (Stredwick), LORNA EVANS (Spencer), NANOOK (Topsvoort).

The following varieties have been deleted from the trials: F. E. HOFFER, FRANK SERPA, HAROLD WELLER, MARDEN ASH, NEAREST BLUE, ORTOLAN, STANDFAST, TWILIGHT.

CLASS VIc—MEDIUM FLOWERED DECORATIVE

Deuil du Roi Albert (raised by Mr. R. Troquay and sent by Messrs. Carter Page & Co., Ltd., 52 London Wall, London, E.C. 2). **A.M.** September 8, 1949.—Described R.H.S. JOURNAL 73, p. 224. (**H.C.** 1947).

Gerrie Hoek (introduced and sent by Messrs. R. Sandford & Co., Barton Mills, Mildenhall, Suffolk). **A.M.** September 8, 1949.—4½ feet. Flowers 6½ inches diameter, Neyron Rose (H.C.C. 623/1) faintly flushed salmon-apricot at base of florets; free and erect, on 9 to 12 inch stalks, well above the foliage.

Airline (raised, introduced and sent by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea). **H.C.** August 18, 1949.—5 feet. Flowers 7 inches diameter, white, inner florets creamy-white; free and erect, on 9 to 12 inch stalks, well above the foliage.

Ambassadeur von Kleffens (raised, introduced and sent by Messrs. de Ruyter Bros., Oegstgeest, Holland). **H.C.** August 18, 1949.—5 feet. Flowers 6½ inches diameter, golden apricot suffused with salmon-orange, near Chinese Coral (H.C.C. 614); very free and erect, on 8 to 10 inch stalks, well above the foliage.

Carmenita (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks). **H.C.** August 18, 1949.—5 feet. Flowers 6½ inches

diameter, Rose Red (H.C.C. 724/2), tips of florets velvety crimson; very free and erect, on 10 to 14 inch stalks, well above the foliage.

Ice Cream (raised, introduced and sent by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea). **H.C.** September 8, 1949.—4 feet. Flowers 6½ inches diameter, cream tinted Dresden Yellow (H.C.C. 64/3); free and erect, on 9 to 11 inch stalks, well above the foliage.

Pierre Thiebaut (raised by Mr. R. Chevalier, introduced and sent by Messrs. R. Sandford & Co., Barton Mills, Mildenhall, Suffolk). **H.C.** September 8, 1949.—5 feet. Flowers 6½ inches diameter, Indian Lake (H.C.C. 826); free and erect, on 4 to 9 inch stems, well above the foliage.

The following varieties have been retained for future judgment: **BARRY COTTER** (Brown & Such), **TRIAL** (Brown & Such).

The following varieties have been deleted from the trials: **BARROWFORD**, **BRIGHTON**, **DOROTHY STANTON**, **IBEX**, **MARIA ORBAAN**, **MARY PARRATT**, **SHEILA MAPPIN** (**H.C.** 1947).

CLASS VIId—SMALL FLOWERED DECORATIVE

Jean Barnes (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks). **A.M.** September 8, 1949.—Described **R.H.S. JOURNAL** 73, p. 222. (**H.C.** 1947).

Sachet (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks). **A.M.** September 8, 1949.—4½ feet. Flowers 4½ inches diameter, Persian Rose (H.C.C. 628/2); free and erect, on 9 to 15 inch stalks, well above the foliage.

Shirley Westwell (raised and sent by Mr. J. F. Barwise, introduced by Messrs. Wm. Westwell & Sons, The Nurseries, Leigh, Lancs.). **A.M.** August 18, 1949.—4 feet. Flowers 4½ inches diameter, Orient Red (H.C.C. 819) overlaid Signal Red (H.C.C. 719); very free and erect, on 9 to 11 inch stalks, well above the foliage.

Caress (raised, introduced and sent by Mr. A. T. Barnes, 13 Cardington Road, Bedford). **H.C.** September 8, 1949.—4 feet. Flowers 4 inches diameter, Scarlet (H.C.C. 19) with a golden orange sheen; free and erect, on 6 to 9 inch stalks, well above the foliage.

Deepdene (raised, introduced and sent by Messrs. J. F. Spencer & Son, Ltd., Hockley, Essex). **H.C.** September 8, 1949.—4½ feet. Flowers 4½ inches diameter, Ruby Red (H.C.C. 827); free and erect, on 12 inch stalks, well above the foliage.

Gloria van Heemstede (raised, introduced and sent by Messrs. Bakker & Geerlings, Heemstede, Holland). **H.C.** August 18, 1949.—4½ feet. Flowers 4½ inches diameter, Primrose Yellow (H.C.C. 601) flushed Sulphur Yellow (H.C.C. 1); free and erect, on 8 to 12 inch stalks, high above the foliage.

Jescot Jim (raised, introduced and sent by Messrs. E. Cooper & Son, Jescot Nurseries, St. Albans). **H.C.** September 8, 1949.—4 feet. Flowers 4 inches diameter, Primrose Yellow (H.C.C. 601) flushed Sulphur Yellow (H.C.C. 1); free and erect, on 6 to 12 inch stalks, well above the foliage.

Tom Barnes (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks.). **H.C.** September 8, 1949.—4½ feet. Flowers 4½ inches diameter, Roseine Purple (H.C.C. 629/2) on a cream ground; free and erect, on 12 inch stalks, well above the foliage.

The following varieties have been retained for future judgment: **BOUNDSTONE ROSE** (Parratt), **FLORIST** (Barwise), **PARMA** (Brown & Such), **PRUNE** (Spencer).

The following varieties have been deleted from the trials: **ATOM** (**H.C.** 1947), **BANTAM**, **BOURNE CRIMSON** (**A.M.** 1947), **CRIMSON PENNANT**, **CRUSOE** (**A.M.** 1933), **FARNHAM GEM**, **FORTUNE** (**A.M.** 1938), **FUSE**, **JESCOT JESS**, **JESLEA**, **LOVEBIRD**, **MOOR PARK**, **MORNING JOY** (**H.C.** 1948), **NEWNHAM WHITE** (**H.C.** 1948), **PHILIP ASLETT**, **PUFFIN**, **TRIM**, **ZINNITA**.

CLASS VIIIa—LARGE FLOWERED POMPON

The following varieties have been retained for future judgment: **BONUS** (Stredwick), **LUCK** (Stredwick), **MY JOY** (STREDWICK), **REDPOLL** (Brown & Such).

The following variety has been deleted from the trials: **BABY WILLY**.

CLASS VIIib—SMALL FLOWERED POMPON

Hopette (raised, introduced and sent by Messrs. J. F. Spencer & Son, Ltd., Hockley, Essex). **H.C.** August 18, 1949.— $3\frac{3}{4}$ feet. Flowers 2 inches diameter, Aureolin (H.C.C. 3/1) broadly edged scarlet; free and erect, on 6 inch stalks, well above the foliage.

Roland (raised, introduced and sent by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea). **H.C.** August 18, 1949.— $3\frac{1}{2}$ feet. Flowers 2 inches diameter, Ruby Red (H.C.C. between 827 and 827/1); free and erect, on 6 to 10 inch stalks, well above the foliage.

The following variety has been deleted from the trials: **PERCY** (**H.C.** 1947).

CLASS IXa—GIANT FLOWERED CACTUS

The following variety has been deleted from the trials: **VOLKAERT'S CHAMPION**.

CLASS IXb—LARGE FLOWERED CACTUS

Bluelight (raised, introduced and sent by Mr. A. T. Barnes, 13 Cardington Road, Bedford). **H.C.** August 18, 1949.—4 feet. Flowers 8 inches diameter, Phlox Purple (H.C.C. 632/1) softly flushed Mallow Purple (H.C.C. 630/1); free and erect, on 6 to 9 inch stalks, well above the foliage.

Pauline New (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks.). **H.C.** September 8, 1949.—3 feet. Plant of compact habit. Flowers 7 or 8 inches diameter, Primrose Yellow (H.C.C. 601); free and erect, on 12 inch stalks, above the foliage.

The following variety has been retained for future judgment: **HOEK'S GLORIE** (Hoek).

The following varieties have been deleted from the trials: **BETTABRACHT** (**H.C.** 1947), **MOEDER BALLEGO** (**H.C.** 1948), **MOTHER OF PEARL**, **PATRICIA LEACHMAN**, **SEA SWALLOW**.

CLASS IXc—MEDIUM FLOWERED CACTUS

Brother Justinus (introduced and sent by Messrs. R. Sandford & Co., Barton Mills, Mildenhall, Suffolk). **A.M.** September 8, 1949.—4 feet. Flowers $6\frac{1}{2}$ inches diameter, Apricot (H.C.C. 609) passing to Maize Yellow (H.C.C. 607), inner florets Sulphur Yellow (H.C.C. 1); free and erect, on 9 inch stalks, well above the foliage.

Charles Andrews (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks.). **A.M.** September 8, 1949.—Described R.H.S. JOURNAL 73, p. 228. (**H.C.** 1947).

Greta Woodhouse (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks.). **A.M.** September 8, 1949.— $3\frac{1}{2}$ feet. Flowers 6 inches diameter, Begonia (H.C.C. 619/1) tinted Porcelain Rose (H.C.C. 620/1), inner florets soft apricot-amber with a golden base; free and erect, on 9 inch stalks, well above the foliage.

Hopeful (raised, introduced and sent by Mr. J. F. Barwise, Towneley Nurseries, Burnley, Lancs.). **A.M.** August 18, 1949.—Described R.H.S. JOURNAL 74, p. 220. (**H.C.** 1948).

Vivianne Coppens (raised by Mr. Florent Braem, introduced and sent by Messrs. J. G. Ballego & Sons, Leiden, Holland). **A.M.** August 18, 1949.—Described R.H.S. JOURNAL 74, p. 220 (**H.C.** 1948).

Abbott (raised, introduced and sent by Messrs. J. G. Ballego & Sons, Leiden, Holland). **H.C.** September 8, 1949.— $3\frac{1}{2}$ feet. Flowers 7 inches diameter, Currant Red (H.C.C. 821), base of florets overlaid with Blood Red (H.C.C. 820); free and erect, on 12 to 22 inch stalks, well above the foliage.

Doris Pembroke (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks.). **H.C.** September 8, 1949.—3½ feet. Flowers 7 inches diameter, Fuchsine Pink (H.C.C. 62711) flushed salmon at base of the florets; free and erect, on 12 inch stalks, well above the foliage.

Good Morning (raised, introduced and sent by Messrs. K. Maarse Dz. Jr., Aalsmeer, Holland). **H.C.** August 18, 1949.—4½ feet. Flowers 6 inches diameter, Phlox Pink (H.C.C. between 625 and 625/1), inner florets creamy-white tinged pale pink; free and erect, on 9 to 12 inch stalks, well above the foliage.

Trajectum (raised, introduced and sent by Messrs. D. Bruidegom, Baarn, Holland). **H.C.** September 8, 1949.—4 feet. Flowers 6 inches diameter, Phlox Purple (H.C.C. between 632 and 632/1); free and erect, on 6 to 10 inch stalks, well above the foliage.

White Superior (raised, introduced and sent by Messrs. K. Maarse, Dz. Jr., Aalsmeer, Holland). **H.C.** September 8, 1949.—3¾ feet. Flowers 6½ inches diameter, pure white; free and erect, on 8 to 12 inch stalks, well above the foliage.

The following varieties have been retained for future judgment: **BROOKLANDS** (Barwise), **BRUIDEGOM'S MYSTERY** (Bruidegom), **ELIZABETH SAWYER** (Sandford), **MARGARET ROSE** (Weyers), **PELEGRINA** (Weyers), **PUNCTUALITY** (Ballego).

The following varieties have been deleted from the trials: **AMI GEORGE**, **ANTLER**, **CONSTELLATION**, **GLACIER**, **GLEN MOUNT**, **GOLD DIGGER**, **KANNON VAN KERKHOVEN**, **NOIRMOUTIER**, **NORA PICKETT**, **NOVIET**, **RESTFUL**, **ROSE HILL** (**H.C.** 1948), **SWEETNESS** (**H.C.** 1946).

CLASS IXd—SMALL FLOWERED CACTUS

Aldyth Joy (of Australian origin, introduced and sent by Messrs. J. F. Spencer & Son, Ltd., Hockley, Essex). **H.C.** September 8, 1949.—3½ feet. Flowers 4½ inches diameter, Orient Pink (H.C.C. 416/1) on a cream ground, flushed Porcelain Rose (H.C.C. 620/1); free and erect, on 6 to 9 inch stalks, well above the foliage.

The following varieties have been retained for future judgment: **FAVORITA** (Bruidegom), **JACQUELINE** (Barnes), **SPECK** (Barwise).

The following varieties have been deleted from the trials: **BESSIE** (**A.M.** 1943), **CHARMING**, **CHINA ROSE**, **DAINTY ROSE**, **FINESSE**, **FIRFLY**, **HYLLA**, **LILLIBET**, **SPORTSMAN**, **TRYST**.

CLASS XI—DWARF BEDDING

Ella Britton (raised and sent by Mr. E. J. Barker, and introduced by Messrs. S. O. Brien Baker, Home Meadows Nursery, Martlesham, nr. Woodbridge, Suffolk). **H.C.** August 18, 1949.—20 inches. Plant of erect, compact habit, with brownish-purple stems and foliage. Flowers double, 3 inches diameter, Indian Yellow (H.C.C. 6), suffused with old gold and Fire Red (H.C.C. 15/1) giving a gold tinged orange effect; free and erect, on 8 to 10 inch stalks, well above the foliage.

The following varieties have been retained for future judgment: **JESCOT HERBERT** (Cooper), **JESCOT MERILEE** (Cooper), **JESCOT YELLOW** (Cooper), **TOPMIX** (Topsvoort).

The following varieties have been deleted from the trials: **FAIRY**, **JESCOT CARMEN**, **JESCOT COED**, **JESCOT KITTY**, **JOY STUBBS**, **R. J. COOK**, **SAMUEL**, **MANSFIELD**, **SHIRLEY YELLOW**.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1949

Chrysanthemum 'Cambria' A.M. November 1, 1949. An old gold incurved variety with good solid flowers 5 inches in diameter. Raised in the U.S.A., introduced and exhibited by Colham Green Nurseries, Ltd., Chapel Lane, Hillingdon, Middlx.

Chrysanthemum 'Incurved Edith Alston' A.M. October 18, 1949. An excellent pure white variety which is stated to remain white for a long time. It is of very good form and is a sport from 'Edith Alston.' Raised, introduced and shown by Colham Green Nurseries, Ltd., Chapel Lane, Hillingdon, Middlx.

Chrysanthemum 'Rotary' A.M. November 29, 1949. A fine exhibition variety of good substance and measuring 7 inches across with long narrow slightly curled white petals. There is a very faint trace of green at the top of the flower. Raised, introduced and shown by Messrs. H. Woolman Ltd., Sandy Hill Nurseries, Birmingham.

Chrysanthemum 'William Greenyer' A.M. October 4, 1949. A well-formed silvery rose-pink variety measuring 6 inches across with incurving inner petals. Raised by Messrs. H. Shoesmith, Ltd., introduced and shown by Messrs. Greenyer Bros., Worthing.

Chrysanthemum 'Winn Quinn' A.M. November 1, 1949. A fine Sulphur Yellow (H.C.C. 1/2) incurved variety with broad florets. The flowers measure $5\frac{1}{2}$ inches across. Raised by Mr. H. Featherby, introduced by Messrs. Keith Luxford & Co., and exhibited by Colham Green Nurseries, Ltd., Chapel Lane, Hillingdon, Middlx.

Cyclamen cyprium A.M. October 4, 1949. This autumn-flowering species is suitable only for the alpine house except in the most favoured gardens where plants may occasionally be seen out of doors. The leaves are slightly mottled and of a dark olive-green colour. Its fragrant flowers, which appear intermittently between September and December, are pure white with a distinctly contrasting, light cerise blotch at the base of each petal. Exhibited by M. Ogilvie-Grant, Esq., 71 Kew Green, Kew, Surrey.

Nerine 'Inchmery Elizabeth' A.M. October 18, 1949. This variety is the result of a cross between *Nerine* 'Aerolite' and *N.* 'Red Knight.' The umbel exhibited had twelve Dutch Vermilion (H.C.C. 717/1) flowers measuring $2\frac{1}{2}$ inches across and having a slightly lighter rib down the middle of each perianth segment. Raised and exhibited by E. de Rothschild, Esq. (gr. Mr. B. Hendy), Exbury, nr. Southampton.

Nerine 'Inchmery Kate' A.M. October 18, 1949. This variety resulted from a cross between *Nerine* 'Alice' and *N.* 'Lady Foster.' The umbel exhibited carried eleven flowers and buds. The former measure 3 inches across and are Rose Pink (H.C.C. 427/3) striped very lightly with a deeper shade. Raised and exhibited by E. de Rothschild (gr. Mr. B. Hendy), Exbury, nr. Southampton.

Nerine 'Nena' A.M. October 18, 1949. The umbel exhibited carried eleven open Rhodamine Pink (H.C.C. 527) flowers measuring

2½ to 2¾ inches across and having a deeper rib of colour down the middle of each perianth segment. Exhibited by Col. R. S. Clarke, M.P. (gr. Mr. W. Fleming), Borde Hill, Haywards Heath.

Nerine 'Stephanie' A.M. November 1, 1949. A very beautiful variety raised by the exhibitor as the result of a cross between *Nerine* 'Mrs. M. Praid' and *N.* 'Countess Altamonte.' The plant exhibited bore six splendid umbels each bearing an average of nine Rhodamine Pink (H.C.C. 527/2) flowers measuring 2½ inches across and having a lighter strip down the middle of the segments. Exhibited by Col. R. S. Clarke, M.P. (gr. Mr. W. Fleming), Borde Hill, Haywards Heath.

ORCHIDS

Cypripedium 'Delysia' var. 'Radiance' A.M. November 29, 1949. The dorsal sepal of this well-proportioned flower is mainly crimson-rose, while the petals and labellum are light brown with mahogany-red shading. Exhibited by Messrs. H. G. Alexander, Tetbury, Glos. Raised by crossing *C.* 'Marmion' with *C.* 'Atlantis.'

Odontioda 'Gera' A.M. November 29, 1949. The spike carried nine bright flowers, rose tinted with much crimson-red spotting. The result of crossing *Oda.* 'Uvalda' with *Oda.* *Pittiae*. Exhibited by Messrs. Charlesworth & Co., Haywards Heath.

BOOK NOTES

"The Elements of Genetics." By C. D. Darlington and K. Mather (Allen and Unwin.) Demy 8vo. Illus. 25s.

The authors are to be congratulated on producing this book, which incorporates the whole science of genetics up to the present. Such a book is badly needed by students and by the general reader who are becoming more and more interested in this absorbing science. There are a number of books on the different aspects of cytology and genetics, but in no other is the whole scope brought together in so concise a manner.

Each chapter is short and at the end of each chapter is a bibliography for further study.

The work is divided into three parts. The first shows how the material lying in the cells of animals and plants determines their heredity. It deals with the chromosome mechanism and the Mendelian laws with a clear description of how certain hereditary factors are linked in their inheritance and how the biometrical technique can help the plant breeder in his endeavours to improve the performance of crops and animals. The last two chapters of this part describe how changes such as sports or mutants come about by polyploidy and other means.

The second part explains how the material in the cells is organized and also the theory of polygenes and major genes. The chapters on the cytoplasm of the cell and how it contains plastids, plasmagones, and their relation to virus and to something the authors have named "provirus" is of major importance. It shows how some diseases of plants are due to the plasmagones and how the organisms are inherited, causing "rogues" in peas and other plants, and "yellows" in strawberries, but virus diseases are caused by infection; yet there is something in between which, for instance, causes the yellowing or variegation in Abutilon, privet and other plants which is not inherited nor caused by infection but is caused by artificial filtration such as grafting. The difficulties in growing the Apple 'Lord Lambourne' appear to be due to this provirus.

The third part deals with the different breeding systems of outbreeding and inbreeding in Nature. It describes the elaborate devices that exist to discourage self-fertilization such as the incompatibility of pollen among Sweet Cherries and the wonderful "pin" and "thrum" structure of the style and anthers in the common Primrose.

The next chapters show how the combination of genetics and environment enable species or races to survive and further how the breakdown of continuity may come about. It may happen in several ways by geographical restrictions, as with Darwin's finches on the Galapagos Islands, or by insects having a predilection for certain flowers as in species of *Antirrhinum*, or again by polyploidy. In plants polyploidy can produce a true breeding hybrid which is in fact a short cut to the creation of a new species. So these forms of discontinuity in genera may mark how "species, genera or even families" have developed. This theory of evolution will be of particular interest to the systematist. All the earlier chapters on the principles and mechanism of genetics lead up to the value of the genetic theory for man and mankind, in medicine, in social inheritance, in race theory and culture and language. The concluding chapter deals with the future of genetics.

The book is excellently printed. The glossary might be expanded to include such terms as "antigen" and "antibody." The book needs study to understand the mass of facts it contains. It will be invaluable to breeders of plants and animals, to the systematist and to those who treat the diseases of man.

F. C. STERN

"Manual of Cultivated Plants." By L. H. Bailey. Revised ed. 8vo. 1116 pp. Illus. (Macmillan Co., New York, 1949.) £6 10s. od.

This book is intended to provide a ready means for the identification of the species in the usual domestic flora of the continental United States and Canada. It is cast in the form of a flora and contains 5,347 botanical descriptions of species grown in the area it covers and incidental references to many others. The first edition published in 1924 contained 3,665 species, and besides the additions made there is considerable re-arrangement in this edition and of course a good many name changes. The name changes are due in several instances to the division of older genera into smaller groups, and in others to the discovery of prior names, or to a revaluation of old specific descriptions. Some prior specific names have not been taken up, whether because they have been overlooked or because they have not proved acceptable to the authors is not clear. Most of the species described are grown in British gardens but the list is by no means exhaustive and with that we can have no quarrel, but so far as it goes it is very well done and should prove very useful to American horticulturists. It does not deal, or attempt to deal, with horticultural varieties, nor does it deal in any way with cultivation. The illustrations consist of outline drawings showing botanical details of representative species in the genera dealt with. The common American names of many plants are given, usually those adopted in the American *Standardized Plant Names* though without contracting several words into one as is often done there, and the derivation and pronunciation of the botanical names is indicated. A copious index occupying 86 pages each with 3 columns of small print makes reference easy. Paper, type and general lay-out are, as one has learnt to expect from this publisher, all that can be desired, but the book is too heavy to use in the garden, it must be reserved for the desk.

"On the Making of Gardens," By Sir George Sitwell. With an introduction by Sir Osbert Sitwell and decorations by John Piper. Royal 8vo. (Droghda Press). 30s.

Sir George Sitwell had a real understanding of those factors which are important in the making of any garden, particularly the large one. It is probable that he hardly contemplated the small garden of to-day. He had an Olympian approach to the subject which I find very refreshing to-day, as refreshing as the right use of water and shade in the garden, factors which he understood so well. This approach is perhaps best exemplified in this quotation, one of the keys to the book. "This, then, leads up to what I believe to be the great secret of success in garden making, the profound platitudes that we should abandon the struggle to make nature beautiful round the house and should rather move the house to where nature is beautiful." I often yearn to do this. The gardens which please us most, Bodnant, Hidcote, Caerhays, to quote three only, have this advantage of a fine natural situation to which the garden making is complementary. The naturalistic and wild styles of gardening, introduced so ably by William Robinson, have held the English field now for the last thirty years to the virtual exclusion of the more formal element, regarded in earlier centuries as the paramount element. Perhaps we should be due for a change again, a swing of the pendulum, although it is a swing made difficult by modern economic conditions. However, there are no better gardens from which to learn these master precepts of design than the great Italian ones and Sir George makes us want to visit them again. Unfortunately it is doubtful if many now are in the same state as when he wrote.

Sir George's sentences are long and flowing as the water he loved, rich with luscious and fine sounding adjectives as the Italian gardens were rich with Cyresses, masonry and urns, but the book has given me, at any rate, much pleasure.

Sir Osbert Sitwell records that his father was disappointed with the appearance of the first edition in 1909. 'This edition also does not seem as attractive as it might be, with the ill-balanced proportions of type area to page, the massive blocks of solid unrelieved colour which form a background to the decorations and the fussy restless type used on the title page for the title. Peace and proportion were the attributes Sir George regarded most in a garden. They are also needed in the typography of a book. Few, however, would cavil at the richness of the hand made paper.

P. M. SYNGE

"*Delphiniums*." By Frank Bishop. 144 pp. Illus. (Collins.) 10s. 6d.

This book is easy to read, contains much useful information, and some of the illustrations are quite attractive. Fortunately no attempt has been made to dogmatize on the origin of the hybrid *Delphinium* which remains in obscurity. The detailed cultural instructions traverse the whole gamut of operations including preparation of the soil, propagation by seeds and cuttings, growing for exhibition, etc., and amateur growers who desire to make crosses will find the chapter on breeding useful as it contains an elementary outline of the Mendelian theory. Intending growers of *Delphiniums* should not be deterred from doing so after reading the chapter of ten pages on "Diseases and Pests," as undue emphasis has been placed regarding the losses caused by 'Black Rot,' etc. It is, however, wise to stress the necessity to guard *Delphiniums* against their greatest enemy, the slug.

Readers will not fail to realize that the author has been an ardent amateur exhibitor as his instructions on the preparation and transport of spikes for showing could only have been written by one with practical experience.

Are there only a "few" *Delphiniums* resistant to mildew?

Reference is rightly made to the fact that American strains lack perenniality. An important point which native hybridists will do well to record.

It would appear unwise to include in a book of this sort a list of modern varieties; what is "modern" to-day, may be "ancient" to-morrow where varietal improvement is so rapid.

Amateur growers will gain much knowledge from reading Mr. Bishop's book and professional growers will peruse it with interest.

ALLAN G. LANGDON

"*Delphiniums. Their history and cultivation*." By G. A. R. Phillips. 114 pp. Illus. Cr. 8vo.

"*Gладиол*." By A. J. Macself. 114 pp. Illus. Cr. 8vo. (Eyre and Spottiswoode). 6s. each.

These two useful little volumes in Mr. Macself's series of "Home Garden Books" were first published in 1933 and 1932 respectively. They have since been revised and brought up to date in the light of modern achievements in the raising of new varieties of these two genera. Each book follows roughly the same plan, dealing with history, species, culture, exhibitions and diseases. There is a complete list of *Delphiniums* which have received awards from 1870-1945 and a diary of *Delphinium* cultural operations month by month. There is a useful list of *Gладиол* species but a list of modern recommended *Gладиол* varieties for the amateur, apart from the commercial grower, seems an omission which might be worth rectifying in future editions.

"*The Living Soil*." By E. B. Balfour. 270 pp. Illus. Demy 8vo. (Faber & Faber). 15s.

This is the eighth edition of Lady Eve Balfour's most notable book which first appeared in 1942 and which has since been revised considerably. The case for the value of compost making in garden operations finds general acceptance to-day and the majority of gardeners now make their compost heap a regular part of the year's operations. The relation of compost grown food to general health is a matter of more controversy and those interested cannot do better than to read this book which is certainly very much alive and written with vigour and probably achieves the difficult task the author set herself of writing both for the specialist and the layman. Its sub-title is "evidence of the importance to human health of soil vitality, with special reference to national planning." It is as much a political book as a biological one and should be read as such but no one can deny the need for understanding between the two.

"Roses." By Bertram Park, O.B.E. 141 pp. Illus. Cr. 8vo. (Pitman) 10s. 6d.

Mr. Bertram Park is one of the foremost growers and exhibitors of Roses in the country and as such his little book will be welcomed by Rose growers. It is a practical book and Mr. Park has the gift of explaining both his theories and his practice clearly and concisely.

He is also a very skilled photographer and most of the photographs in this book are his own work. There are four plates in colour. The book is addressed modestly to those "who love Roses but who perhaps have not had sufficient experience in growing them at their best." It should be a very great help to them, but I anticipate that it will be read with enjoyment and interest as well by the expert rosarian. The whole subject seems to be covered in a very small space and there is a valuable selection of modern hybrid tea roses which should help many to select through the manifold varieties of the Rose catalogues. One of the most encouraging remarks in the book is that in the last thirty years fragrance has gradually been bred back into our new Roses.

"Fruit Culture." By A. H. Hoare. 347 pp. Illus. (Thomas Nelson & Sons, Ltd.) 12s. 6d.

This is a well-planned book, essentially of a textbook character on scientific lines, and to some extent presupposes on the part of the reader a certain amount of botanical knowledge. The author endeavours in the relatively small compass available to him to cover a very wide field, "dealing with the whole range of edible fruits cultivated by man." It is inevitable, therefore, that the treatment of some of the fruits must be of a somewhat superficial nature; but he has been, on the whole, successful in compressing a deal of informative material in the pages of this book. For the serious student requiring further information there are references to other books, reports and papers at the end of appropriate chapters "for further reading."

The first part of the book is devoted to general principles. The second part deals with the individual fruits. "The book is written mainly to meet the point of view of the commercial operator," but there is a short chapter on "Fruit Culture in the Home Garden."

The author first gives an account of the botanical structure of the common types of edible fruits and discusses their dietetic value. A short review of the statistical position as revealed by the 1944 census of trees and planted acreage is included. Various methods of propagation are then explained, and there is a useful chapter devoted to the factors influencing crop production. Nutritional requirements and some of the common element deficiencies are discussed. Then follows a chapter on the genetics of fertility and incompatibility, this complicated biological subject being explained in a lucid manner. It might have been better to have avoided the introduction of the term *synopsis*, which has not been explained in the short account of reduction division (*meiosis*). Planning and planting, plant health and protection against pests and diseases, pruning, orchard management, and the economics of fruit production, have their special chapters in this first part of the book, the last-mentioned subject dealing with marketing, production costs, and the general finance of fruit-growing.

Part II of the book deals in detail with the different kinds of cultivated fruits. The inclusion of tropical and sub-tropical fruits adds interest for the general reader. A chapter on the salad fruits is an innovation in a book of this sort, and there is also one on fruit for canning. The commoner pests and diseases of fruit crops in Britain are then briefly dealt with, and there are useful appendices of special interest to those about to take up commercial fruit-growing.

The photographic illustrations might well have been more numerous; as a whole they are rather disappointing, some, indeed, having little or no message to convey.

We should like to have seen the chapter on "Fruit Culture in the Home Garden" expanded somewhat, the subject being covered in rather brief fashion in about five pages; no doubt the exigencies of space had to be considered. One particularly good piece of advice given is that "the first thing the home fruit-grower must do is to secure correct and sound planting material." "It is the haphazard acquisition of planting material about which nothing is known that is more often than not a waste of time and money." The selection of Apple varieties suggested for the home garden is a poor one, those mentioned being, with perhaps one exception, the sorts that can in ordinary times be purchased in the shops; they are given as an example of a "range of varieties which would provide apples from July to March." It would have been better to have given a selection of choice sorts to cover an even longer period.

There are a few what might be termed typographical errors or repetitions which will no doubt be rectified when another edition has to be printed.

All fruit-growers, professional and amateur, will find much interesting and informative matter in this book; and to the student who is considering taking up fruit-growing commercially it will present a profitable introduction to the subject.

HOWARD H. CRANE

"Fruit-Growing for Amateurs." Edited by N. P. Harvey. 128 pp. Illus. (Published by Plant Protection Ltd. and distributed by Simpkin Marshall (1941) Ltd.) 8s. 6d.

This is a nicely got-up book, "the first of a new series of horticultural publications by Plant Protection Ltd., designed to acquaint gardeners both with traditional methods of good cultivation and the latest achievements of scientific research." Its aim is "to cover the general cultivation of tree and bush fruits, mainly from the standpoint of the gardener," and it does not purport to "offer an exhaustive treatment of so wide a subject."

The cultivation of the popular tree fruits and soft fruits is dealt with in turn. Separate chapters are devoted to Apples, Pears, and Plums respectively. Then come "notes on the colour plates" and the colour plates themselves. These are followed by a separate chapter on Cherries. Then Peaches, Nectarines and Apricots share a chapter, followed by a short one on Medlars, Quinces and Mulberries.

The cultivation of "black, red and white Currants" is covered under one and the same chapter. In view of the widely differing treatments required by Black and Red Currants, from propagation onwards, we think it would have been better if Black Currants had been given a chapter to themselves, or at any rate to have had the chapter more distinctly divided; this would avoid risk of confusion on the part of the amateur new to fruit-growing. Gooseberries, Raspberries and Strawberries are given a chapter each. Another chapter is devoted to Blackberries, Loganberries and Hybrid Berries. The final chapter in the book deals somewhat ambitiously with Cobnuts, Filberts, Walnuts, Figs and Grapes. Although this last chapter is appropriately subdivided and the information given under each heading is brief—Grapes, for instance, being dismissed in just over a page—we think a separate arrangement would have been preferable. There are short historical notes on each fruit dealt with, which add to the interest.

References to a "complete fertilizer" are made in the text; we suggest that the amateur would like to know how to make up such a manurial compound and to have details of the ingredients. And would the novice know what is meant by "a dressing" of sulphate of ammonia or nitro-chalk without some reference to actual quantity or area covered?

The coloured illustrations—from original water-colour sketches—of pests and diseases are a feature of the book. They are carefully executed and well reproduced, giving an excellent representation of those enemies the amateur is most likely to meet. There should be no difficulty whatever in identifying every one of them. These illustrations are captioned and have a cross-reference to the description in the text.

Having regard to the importance of pest and disease control, which is well stressed in the chapter on Apples, it might have been well to have brought in the spraying routine as part of the cultural treatment.

There are also some coloured plates from water-colour sketches of six Apple varieties: 'Orleans Reinette,' 'Blenheim Orange,' 'Cox's Orange Pippin,' 'Laxton's Superb,' 'Lord Derby,' and 'Bramley's Seedling.' These are admirable; there may be some criticism, however, that the colouring of Cox is not truly representative of that variety.

The other illustrations take the form of line drawings or diagrams in interpretation of the text. The illustrations are, perhaps, less numerous than we are accustomed to in many books of this sort, but they are sufficient to bring out relevant and important points.

HOWARD H. CRANE

"A List of Abbreviations of the Titles of Biological Journals." 26 pp. (Issued by the Biological Council, obtainable from H. K. Lewis & Co. Ltd.) Price 2s. 6d.

This booklet gives a list of the standard abbreviations in a handy form of the titles of biological journals and should prove extremely useful to those engaged in the preparation of scientific papers, as well as to Editors. It was prepared as the result of a meeting of Editors of the principal journals in the biological field and is based largely on the abbreviations given in the World List. It has been prepared by Mr. R. W. Marsh, Editor of the *Annals of Applied Biology*.

ERRATA

"Flora of Gloucestershire," page 552, Vol. 74, December, 1949

The Hon. Librarian of the Cotteswold Naturalists Field Club has asked us to state that the price of this volume has now had to be raised to three guineas and that the address from which it may now be obtained is the City Library, Gloucester.

FIG. 34, February, 1950, Vol. 74

It is regretted that the caption underneath this plate incorrectly stated that it was a Fuchsia cutting. The plate showed a Dahlia cutting attacked by the Broad Mite.

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WISLEY IN APRIL

Now that spring has arrived, visitors to Wisley will find something to interest and please them in every part of the Gardens; for not only are the collections in the glasshouses still attractive, but many ornamental trees and shrubs are coming into flower, fresh green foliage is appearing everywhere, and many small bulbous and herbaceous plants are in bloom in the Wild Garden and elsewhere.

On entering the main gate the eye is at once attracted to the bold masses of *Alyssum* and *Aubrietia* hanging from crevices in the sandstone walls, and closer inspection reveals many another less conspicuous plant of more enduring interest, such as the *Sempervivum* cushions, still expanding after more than a quarter of a century's growth.

Turning left from the Terrace, where the spring bedding will be at its best at the end of the month, towards Battleston Hill, one comes to the Daffodil Trials, containing varieties suitable for garden decoration. Before the Daffodil season is over, the beds higher up the hill will be dappled with the bright little flowers of the Kurume Azaleas, a race of compact, evergreen forms of *Rhododendron obtusum* var. *japonicum*. For those who like their Rhododendrons on a large scale the trial collection of hybrids just across the broad walk exhibits a range of habit, colour and season to supply the most varied needs. In complete contrast there is the collection of species on the crest of the hill, many of them possessing qualities unsurpassed in the hybrids.

Crossing the public footpath by the bridge leading to the main part of Battleston Hill one finds, in addition to a still more extensive planting of Rhododendrons, many young Camellias, already flowering freely; a variety of Magnolias, including *M. Kobus*, *M. salicifolia* and *M. macrophylla*, well established and showing promise of developing into very fine specimens, and a wide selection of Maples, Sorbus and other trees.

The Japanese Cherries occupying the field between the hill and the Portsmouth Road are not yet large enough to make a spectacular show, but the respective merits of the most popular varieties may be judged by an inspection of the much older trees behind the Rose borders on Weather Hill, in Seven Acres and in Howard's Field. The floriferous *Prunus yedoensis* and the larger-flowered pink *P. Sargentii*, so valuable for its autumn colour, are among the earliest; and the exquisite *P. serrulata* var. *spontanea* (syn. *P. mutabilis*), whose small white or pale pink blossoms appear with luminous copper coloured leaves, is endowed with uncommon grace. For those who prefer the larger double-flowered varieties, there are the vigorous, erect, rose-coloured 'Kwanzan,' 'Ukon,' combining almost sulphur-yellow flowers with tinted foliage, 'Oku-miyako' with full, near-white flowers on long, pendent stalks, and 'Shiro-fugen' with prettily-disposed pale pink clusters among bronze leaves.

In the same parts of the Gardens there are many different Crab-apples, all lovely in flower and many again prominent in the fruiting season. The richly-coloured *Malus purpurea* and the related *M. Eleyi* and *M. Lemoinei* always win well-deserved admiration; but one should

not overlook *M. baccata*, of snowy whiteness, *M. Zumi*, with slender, almost weeping sprays of little pink blooms, *M. Hartwigii* with very large flowers, or 'Frettingham Victoria,' rather ordinary in flower, but rarely failing to mature a heavy early crop of small, scarlet apples.

There should be no lack of interesting things in the Rock Garden during April, but in the past winter a great deal of much-needed clearing and replanting has been done, and some time must elapse before the broad patches of colour, so desirable in a large rock-garden, are achieved. Some plants which will be good at the present time are the varieties of Aubrietia, Phlox and Viola, the several species of Aethionema, forming little greyish bushes covered with pink flowers, Omphalodes, of vivid blue, and many different Saxifrages. The small-flowered Rhododendrons, such as *R. impeditum*, *R. intricatum* and *R. chryseum*, are massed in several places, and are particularly effective above the bog garden, where the huge clumps of *Lysichitum americanum* have sent up their fleshy, golden spathes in advance of the leaves. *L. camtschatcense*, a plant of less coarse growth than the preceding, is producing white, Arum-like inflorescences close by. Near the margins of the ponds there are Marsh Marigolds, both single and double, the first flowers of *Primula japonica*, and the rosy heads of *Saxifraga peltata* on gaunt, leafless scapes.

In the Wild Garden there will be many Rhododendrons, both species and hybrids, represented by larger specimens than those on Battleston Hill. *R. Kewense*, the original hybrid from *R. Griffithianum* × *R. Fortunei*, which was raised some twenty years before *R. Loderi* made its début, has developed into a bushy-topped tree, some of the specimens of *R. campanulatum*, *R. arboreum* and *R. niveum* are nearly as large, and there is an unusually good bush of *R. Wardii*. The old bushes of *Camellia japonica*, planted by the first owner of the Gardens, MR. G. F. WILSON, still flower freely every year. Some other choice shrubs to be seen now are *Corylopsis Willmottiae*, with sweet, sulphur-yellow flowers, *Enkianthus perulatus*, with numerous little white bells, and *Viburnum Burkwoodii*, inheriting from one parent, *V. Carlesii*, its compact clusters of fragrant blossoms and from the other, *V. utile*, its free and open habit of growth. Elsewhere in the Gardens now may be seen *V. Carlesii*, *V. bitchiuense*, and *V. Juddii*, a graceful hybrid raised from them and combining all their good qualities.

Scattered among the shrubs in the Wild Garden, following the drifts of *Narcissus cyclamineus*, comes a succession of brightly-coloured flowers, including *Anemone nemorosa* and *A. apennina*, *Erythronium revolutum* and the gay *E. tuolumnense*, *Soldanella montana*, long established in a secluded corner, *Shortia galacifolia* in extensive drifts, covered with fringed white bells, and *S. uniflora grandiflora* with larger, daintily poised pink flowers nodding above glossy bronzed leaves.

THE PEAT GARDEN

A POSSIBLE SOLUTION TO THE NORTHERN SLOPE

A. Evans

(ROYAL BOTANIC GARDEN, EDINBURGH)

THE south facing slopes of our gardens are recognized as natural assets by all who are interested in the growing of plants. But what of the opposite aspect, can the same be said of it? No! much more thought and imagination must be exercised in the choice and arrangement of plants intended for the northern slopes. What usually develops on such situations are the too often seen shrubberies which, although not entirely in a state of suspended animation, never really produce many flowers or fruits. The suppression of the flowers and fruits in these collections of trees and shrubs is usually caused by impoverished soil—lack of sufficient sunlight—the wrong species being chosen for the site—too much moisture—or any combination of these conditions. The highest compliment that can be paid to such associations is that they provide a vegetative covering for the bare soil. Certainly they must rise to something more than this if they are to inspire an interest for the whole year.

Just as the Rose, Aquatic and Alpine Gardens provide the conditions for their own particular types of plants, so then, with the gardener's aid, the environment of the north facing slope can be made suitable for another form of specialized gardening, namely "The Peat Garden." This type of gardening does not seem to have been given a great deal of thought or publicity at any time.

At Logan in Wigtownshire, until recently owned by MR. K. MCDOUALL and his brother MR. D. MCDOUALL, walls constructed entirely of peat blocks were used to terrace a northern slope. On these terraces were planted many specimens of the rare and exotic trees and shrubs found growing in that paradise garden in the Mull of Galloway. A spectacle I shall always remember was a view of the large leafed Rhododendrons planted tier upon tier on a hill slope and receding into the distance until lost among the conifers and birches with which they were interplanted. I might also add that many of the species of Rhododendron and of the other genera accommodated in this garden, were regenerating themselves naturally on the tops and faces of these walls in a manner that suggested naturalization.

In a lovely setting at Edinburgh, this new development in horticulture has been brought up to par with all other types of gardening. Lying away from the sun and situated on the north side of a Woodland Garden this is one of the most interesting areas in the Royal Botanic Garden. Literally thousands of plants are at home here, Conifers, small trees, evergreen and deciduous shrubs, herbaceous and bulbous plants. It is bounded on the south and west by a background of evergreens while the remaining two aspects are pleasingly merged with the lawn by an irregularly laid grass verge.

Whether constructed on a large or small scale, the possibilities of

the Peat Garden are tremendous, for just like the Rock Garden a great number of species may be contained in a small area.

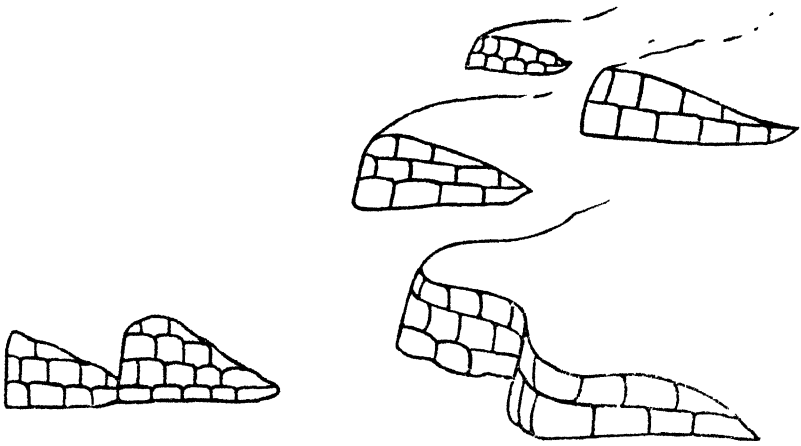
Site. A north facing, gentle slope should be chosen as the site for the Peat Garden; it should be shaded from the south by a background of evergreen trees and shrubs which if not already in existence will have to be included in the planting programme. Also, if the slope terminates in a hollow, the lowest planted area must end slightly up the slope so minimizing the risk of frost damage to those plants which are to be included in the foreground. Neither lime nor chalk must be present in any form in this area.

Plan. The most important item in any building operation is the planning of it, so that once the site for the Peat Garden has been chosen a plan must be drawn up for it. The natural fall of the land should be preserved as far as possible utilizing the contours already existing. By doing this time and labour will be saved. Shown also on the map will be the positions of the proposed walks and paths which are to transverse the area, while sketched in roughly will be the outlines of the main peat buttresses and walls which are to support the banks of soil behind. Where the soil is heavy drains may have to be incorporated.

Material. Samples of the proposed medium should now be obtained from the various peat sources near at hand and providing the pH value is not below 5.0 the consistency of the peat is the most important factor. Its texture must be fairly fibrous, solid without being hard, and reasonably easily cut into blocks with a spade, the most convenient size for handling being approximately a 12-inch cube. Peat is formed through the arresting of the decomposition of vegetative matter by the area becoming waterlogged, and as its constituents vary all over the country it would be unwise of me to try to describe here the precise composition of peat. However, I see no reason why most peat bogs should not yield enough peat of the type required. To avoid too much handling of the peat blocks and so prevent them from being damaged during the shaping operation, they should be stacked clear of the area until required.

Construction. After clearing away all unnecessary surface vegetation, the ground should be thoroughly cleared of noxious weeds before commencing to build. When this is done the paths are the first feature of a permanent nature to be laid down. If leading through a background of shrubs to join with another lawn higher up the slope, these paths should be turfed, but if the background is coniferous they should be bottomed with stones and strewn with Pine needles to blend with the surroundings as they disappear among the trees. The paths should have no definite edges, but should be determined by the occasional planting of dwarf evergreen shrubs, especially on the corners. The prominent and lesser upfolds can now be moulded using soil to deputize for the walls of peat and when it becomes necessary to excavate, the top soil must always be put aside and returned to its proper place after sufficient subsoil has been removed. At no point in the lowering of the soil level must it ever fall below that of the lawn from which the scheme starts, nor must saucer-shaped depressions be made as they will create frost hollows. The avoidance of areas in which frost and damp will persist is essential to the success of any form of gardening. Where the soil is heavy it is

advisable to tile drain most of the area, but if the soil is of a sandy nature a few tile drains leading from the base areas to any existing drain, ditch or prepared sump will be all that is necessary. These pipes will help to reduce the water content of the soil to a reasonable state in what would obviously be wet lower levels. A further precaution against the development of stagnant areas, when moulding the slopes, is to arrange that no terrace ever runs straight back into the face of another wall. It should be so shaped that it gradually falls away on one side until, where its own peat blocks run to earth, it merges with a slope leading to the lower area. The strict observance of the rule, that no matter from which direction water is seeping through the peat there should always be a natural decline available to guide it to the lower region and the drains, is liable to be the difference between success and failure when it comes to keeping rare plants alive during the winter.



Wrong way. Moisture stagnates in the V

Right way. Excess moisture runs off.

The walls themselves should be almost entirely constructed of these peat cubes, rising from properly laid foundations and laid course upon course, each succeeding layer being laid slightly further back than the face of the preceding one and overlapping its joints. Where the walls exceed two feet in height an occasional long stone with at least one squared end may be incorporated in the building, its face being placed flush with that of the wall so that the remainder runs lengthwise into the mound behind. This will help to strengthen the walls and to some extent prevent them from collapsing should pressure be exerted on them from the rear. The wall face should never be fashioned perpendicularly but rather with a slightly backward lie and in place of mortar and cement the crumbings of the greasy peat can be used to bind the blocks together. When the walls have reached the desired height, thin iron rods, at least a foot longer than the walls are high, should be driven down through the peat blocks every few feet until flush with their tops. These will provide the walls with extra support. Finally to seal the top layers, strips of turf should be placed along their whole lengths, only the smaller walls being left uncovered. To a certain extent the turf will

protect the peat from weathering and crumbling too quickly and will require only an occasional clip to keep it within bounds. The Peat Garden should be constructed in an informal manner suggesting a weathered peat slope scoured and fissured by numerous water courses which have long since changed their beds. The actual building now complete, the whole area can be made up to the heights of the finished walls by adding peat, leaf mould and sand in liberal quantities and thoroughly mixing them with the existing loam. The amount of sand used will be determined by the nature of the soil, rising in its application from sandy to clayey soils. With an aspect such as this sharp drainage is a dire necessity. To place the picture in its proper frame, the surrounds of the Peat Garden should be laid with turf, the wider the sweep of green before the actual start of the Peat Garden proper, the better. An irregular curved edge to the lawn and one or two tongues of grass stretching into the area give a picturesque effect, while an odd bed placed in the lawn a little way from the front of the garden gradually smooths out the perspective.

Primarily, all the genera and species to be incorporated in this area must be peat lovers. Secondly, although having no vegetative canopy directly overhead, they must be of a type that will flourish in partial shade and finally be able to thrive where the moisture content of the soil is higher than normal. Their uses will vary from shrubs used as background, middle distance and foreground single specimens (whose purpose it will be to break up the flatness of the terraces) to the grouping together of herbaceous and shrubby species for mass effect. Where this is done they should never be arranged in formal groups but rather the reverse, always trying to give the impression of having grown from seed naturally distributed by the wind. Also required are plants suitable for furnishing the tops and faces of the walls.

Fortunately two large families, the Ericaceae and the Primulaceae, are natural lovers of this type of environment, so it is not surprising that these two natural orders can supply the bulk of the permanent flowering plants for the Peat Garden. Another family of which great use can be made is the Pinaceae from which most of the Conifers can be drawn.

From what will now be a heavily wooded background, it is necessary to thin down gradually the planting of shrubby and taller growing species until, close to the front and the grass verges, larger areas are made available in which bulbous and herbaceous perennials can be planted. During the summer months it may be found necessary to water this area periodically as most of the semi-woodland and shade-loving plants, which are to comprise the bulk of those planted here, appreciate ample moisture during their growing period.

Rather than conclude with long lists of genera and species suitable for planting in the many different positions now available, I shall confine the remainder of this article to describing a number of through-the-seasons-visits to the Peat Garden at the Royal Botanic Garden, Edinburgh. This, I think, will be much more interesting and will give a better illustration of the correct positioning and other uses of the plants.

During the early months of the year very little is to be found in the

way of plants in flower to draw attention to this site. Fortunately, however, nature produces other attractive features in plants and as the Peat Garden comes into view, one's first impressions are of the number of different shades of blue and green. These shades are supplied by the large variety of Conifers and Rhododendrons. Almost in the middle of the scene a large specimen of *Tsuga Mertensiana* predominates with needles of a glaucous green, while in the background the taller growing Conifers compete with each other for prominence each supplying a different shade of foliage to its neighbours. Two small trees of *Acer Forrestii* are also there displaying their beautifully marked snake-bark boles, while to the right, but still in the rear, the trunk and branches of a twenty feet specimen of *Betula utilis* are covered with those twisted paper-like scrolls of creamy bark. A smaller specimen of *Acer griseum*, planted a few yards away, has bark of a similar nature only the colour here being a shiny copper.

Backed by a Lawson's Cypress and ushering in the New Year, providing the weather is open, the precocious, bright, rosy purple flowers of *Rhododendron mucronulatum* add a touch of a different colour to the scene. Beneath an overhanging branch of *Pinus muricata* the white flowers of *Rhododendron moupinense* are bursting; but without protection one night of frost will brown all the open buds. Also at this time, and without shelter, *Arctostaphylos Manzanita* may be seen in flower with its dense panicles of white to light pink bells. Although March and April are really the flowering months for this species, with mild spells, it is often induced to flower early. Sheltering beneath the protective covering of cloches which guard their crowns from excessive damp during the winter, a few members of the Petiolaris section of *Primula* are in flower; their short scapes rising from a tight rosette of leaves are topped with white-eyed, large blue, purple and pink flowers, *Primula bhutanica* (Fig. 77), *P. sessilis*, *P. Edgeworthii* and its white form *P. Edgeworthii alba*. A large number of the crowns are actually planted horizontally in the crevices and joints of the wall faces. These plants should be looked over periodically and firmed up as they have a habit of pushing themselves out of the soft peat. The small *Helleborus purpurascens* is also in flower.

Approaching spring brings a greater variety of plants into flower and during February *Primula scapigera*, *P. gracilipes* and *P. bracteosa* (Fig. 74) are added to those of the same section already in flower. Also blooming are groups of *Primula denticulata*, also its variety *alba* and that lovely, early flowering *P. megaseaeifolia*. The twin-flowered "Snowflake," *Leucojum vernum*, with its green edged perianth, is now popping up beneath some of the taller shrubs and within the shadows of the walls, also, at a junction of the Peat Garden and Wild Garden it is making a lovely combination coming through among the blue, star-shaped corollas of *Anemone angulosa*. Providing the scene with more colour a few plantings of *Bergenia ligulata* are flowering well within the shade of some of the taller growing shrubs. On top of one of the front walls, *Sarcococca humilis*, a small shrub about fifteen inches high, is bedecked with its small, white, sweetly scented flowers. Meanwhile on different levels many varieties of *Erica carnea* are bright with colour.

The winds of March do very little to halt the forward swing of nature's pendulum and many and varied are the genera now in flower. The wood anemone, *Anemone nemorosa* and its larger flowering form var. *Robinsoniana* are massed in natural groups on the slopes and terraces, forming carpets of white and lavender blue. So too, the tall growing *Rhododendron oreodoxa*, a very floriferous species aptly named, 'The Glory of the Mountains,' is covered with its blushing pink flowers. Planted in a commanding position on a corner where a path turns into the Woodland Garden, this *Rhododendron* is a mound of colour. Drifting down the side of one of the slopes a planting of *Soldanella pusilla* looks very charming indeed, the slender, drooping lilac coloured bells barely rising 3 inches above the soil level. In a similar position, and not so very far away, the more robust species *Soldanella montana*, is looking every bit as attractive as its dwarfier brother. To contrast with the pink drooping umbel of *Bergenia crassifolia* and swinging round the front of a dwarf *Rhododendron* plant are the white flowers of *Anemone angulosa nivea*, perfectly formed stars. Close in beside *Rhododendron mucronulatum*, which, by the way, still has many unopened flower buds, is *Trillium ovatum*, a bulbous liliaceous plant with three large white perianth parts which open out to display the six clear yellow stamens inside. With slightly larger petals *Trillium grandiflorum* is happily flowering in front of one of the high walls. Cushions of *Corydalis solida* and 'The Glory of the Snows,' *Chionodoxa Luciliae gigantea* are full of colour, while clumps of *Epimedium concinnum*, *E. pinnatum* and *E. versicolor* are flowering by the edges of the paths and lawn. Another member of the Berberidaceae in flower is *Plagiorhegma dubium*, more widely known as *Jeffersonia dubia*, only a small planting but looking very proud on top of one of the walls. Against their purple mottled leaves the large pink flowers of *Erythronium Dens-canis* are now in evidence forming colour patches in many positions. A large irregular planting of the 'Canadian Blood Root,' *Sanguinaria canadensis*, which until recently looked like a crop of fungal fructifications is now in flower, so also is its double form *forma flore plena*. Taking well to their homes in the wall faces many large plants of *Shortia galacifolia* and *S. uniflora grandiflora* are putting up a fine display, the white and large pink flowers respectively being well set off against a base of waxy green leaves. On the slopes and terraces many more species of *Primula* are now in full flower. Besides all the other species before mentioned *Primula amoena*, *P. Clarkei*, *P. cortusoides*, *P. frondosa* another perpendicular dweller, *P. rosea* and the common Primrose *P. vulgaris* are showing their first flowers. *Rhododendron Cilpinense* a hybrid between *R. ciliatum* and *R. moupinense* is now in full bloom its pink flowers being abundantly produced so long as the weather stays mild. *Rhododendron intricatum* and *R. leucaspis* are also in flower. The Witch Hazel Family, *Hamamelidaceae* is represented at this time by two genera planted well back, almost next to the Conifers, *Sycopsis sinensis* and *Corylopsis Willmottiae*, the fragrant, soft yellow flowers of the latter being produced in pendulous racemes, truly a beautiful species. *Pieris floribunda* well named with its many dainty, white, bell-shaped flowers is positioned on a middle terrace on top of and at the base of one of the walls.

As April progresses, brighter and brighter becomes the Peat Garden. *Epimedium macranthum* and *E. pulchellum* form areas of colour in the open positions and dotted here and there through the terraces are bulbs of the 'Snakes Head' Fritillaria, *F. Meleagris*, both the mottled and white varieties. They look very much at home as they push their way up through the turf on top of the walls. Drifting between the shrubs and on the slopes and terraces, Primulas of the following species will be found in flower:—*Primula chionantha*, *P. saxatilis*, the very dark maroon coloured one *P. Calderiana*, *P. sinopurpurea*, *P. burmanica* and *P. involucrata*. The very charming little species *Primula muscarioides*, which gives its name to the section, also *P. yargongensis*, *P. apoclita*, *P. Ellisiae*, *P. japonica* and the purple flowered *P. pulverulenta*, whose scape is thick with farina, make this area very colourful. Forming healthy mats in the faces of the walls are plants of that lovely genus, Schizocodon, *S. macrophyllus*, *S. alpinus* (Fig. 75), and the tiny one not more than 4 inches high with rose coloured flowers, *S. soldanelloides*. *Trillium erectum*, *T. undulatum* and *T. sessile* are in bloom, the dark velvet purple petals of *T. sessile* being set right down in the junction of three leaves which form an Elizabethan collar round the flower. Starting close into the grass and drifting into the side of a two-feet peat wall is a planting of *Uxularia perfoliata*, its drooping yellow flowers, growing to a height of 15 inches, are well set off against the gray of its foliage and the brown of the peat buttress. *Dicentra eximia* has a place on one of the slopes, the finely cut leaves and hanging pink flowers making a pleasant combination. This species is lifted annually to keep it within bounds. A very charming feature is a large planting of *Meconopsis quintuplinervia*. Growing between some of the dwarfer Rhododendrons this planting is measured by the square yard and is still spreading through the soil. (Fig. 80.) A very acceptable introduction from Kansu, its lavender blue hanging flowers are produced singly and bristle with bunches of creamy stamens. Happily placed in the joints and crevices of the peat blocks a fine collection of Haberleas are on flower, *H. kewensis*, *H. Ferdinandi-Coburgi*, *H. virginialis*, *H. rhodopensis* and its varieties *alba* and *latifolia*. These members of the Gesneriaceae usually have lilac coloured flowers with a few spots of gold round their throats and they rise from large rosettes of broad, crinkled leaves. On a high nose that old plant *Jeffersonia diphylla* is in flower; so too is one of the hardy Lady's Slipper Orchids, *Cypripedium calceolus* with yellow-brown flowers. These plants are positioned low in the site to provide them with the moisture they need. Dotted in the rear, between some of the taller shrubs, the larger, lemon coloured flowers of *Meconopsis integrifolia* can be seen. This, unfortunately, is a monocarpic species which must be raised from seed annually if it is to be perpetuated. A few more species of *Trillium* can now be seen, *T. cernuum*, *T. erectum*, *T. grandiflorum roseum* and *T. stylosum*. At the same time the Primulas, due to their quantity of flowers are very conspicuous, terraces, walls and slopes being well supplied with large groups of the following:—*Primula apoclita*, *P. capitellata*, *P. glomerata*, *P. chungensis*, *P. jesoana*, *P. rosea* and all the species that have gone before. The large white flower heads of *Ourisia macrophylla* seem too heavy for their flower stalks and spread out over the ground (Fig. 79), meanwhile

from underneath a dwarf *Rhododendron* the lovely pink flowers of *Oxalis enneaphylla* and the deeper red ones of *O. enneaphylla rosea* come peeping into view. Forming closely matted shrubs and not more than a few inches high, the bright magenta flowers of *Polygala Vayredae* are made even more conspicuous by their yellow, extruding stamens. In a shady spot *Daphne pontica* is displaying its yellow green flowers. At the same time *Corylopsis yunnanensis* and the monocotyledon with reticulate venation, *Paris quadrifolia* are also in flower. *Ledum palustre* forms quite a carpet as it slides down one of the slopes. *Fothergilla major* is now at its best with flower heads which are really balls of stamens, no petals being produced and an isolated specimen of *Magnolia stellata* is covered with its white many petalled flowers. One of the most charming of all the plants flowering at this time is *Menziesia ciliicalyx* growing 18 to 24 inches high. The corolla, which is fringed at the mouth, is purple in colour, gradually lightening to pink at the junction of the petals and sepals. This species looks very well planted in a group by the side of a path. *Orphanidesia gaultherioides*, a rare shrub of scarcely 4 inches high, is almost completely covered with large pink flowers. Creeping over the top of one of the walls and spreading very rapidly is *Vaccinium Nummularia*, whilst on ledges and slopes *V. Myrtilus* a native, *Phyllodoce empetrifomis*, *P. caerulea* and the species with yellow bells *P. aleutica* are flowering. Under the protection of an overhanging *Rhododendron* branch, a small patch of *Linnaea borealis* with pink fragrant flowers is becoming established. Among the *Rhododendrons* now to be seen, *R. ciliatum* is looking extremely well, as also are, *R. canadense*, *R. hippophaeoides*, *R. lapponicum*, *R. intricatum*, *R. quinquefolium* and *R. racemosum*. Being more or less dwarf species these are all planted throughout the middle and front regions of the Peat Garden. Along the base of the Conifers, *Rhododendron barbatum*, *R. campylocarpum*, *R. cyanocarpum*, *R. fictolacteum* and *R. neriiflorum* are bursting open their flower trusses.

Most of the genera mentioned for April will still be flowering in May, this month and June being the peak periods for flower colour. *Arctostaphylos media* and *A. punila* are covered with their hanging bells, while the stiff stems of the *Cassiopes* (*C. tetragona*, *C. Mertensiana*, *C. lycopodioides* and *C. fastigiata*) are sitting up dangling their little white flowers from their tips. *Gaultheria hispida* and *G. Veitchiana*, both planted over the tops of buttresses and down declines, are given a chance to show off their flowers to advantage. The drooping deep violet flowers of *Omphalogramma vinciflorum* are now fully developed; a native of China its solitary flowers are produced on stems 6 inches high. (Fig. 76.) A round hummock of *Leiophyllum buxifolium* has a pink and white speckled appearance by virtue of its unopened and open flowers. A well-shaped plant of *Rhododendron Williamsianum* has a good position near the front but unfortunately this species does not flower well here although it is worth cultivating for its attractive leaves. Those *Rhododendrons*, which do flower well, and are informally planted through the whole area commence their flowering periods now. They are *Rhododendron cantabile*, *R. oreotrephes*, *R. prostigiatum*, *R. keleticum*, *R. Anthopogon*, *R. leucaspis* still bearing its lovely white flowers and brown stamens, *R. repens*

chamae-Thomsonii, *R. fastigiatum*, *R. scintillans*, *R. drumonium*, *R. calostrotum*, *R. saluenense* and many more. Those actually growing on top and in the faces of the peat walls are:—*Rhododendron repens chamaedoxa*, *R. imperator*, *R. campylogynum*, *R. tsangpoense*, *R. impeditum*, *R. myrtilloides*, *R. pemakoense* and *R. radicans*. While the many *Rhododendron* species are in bloom the blue flowers of the 'Tibetan Poppy,' *Meconopsis betonicifolia* are in attendance. Also situated on the high ground other species such as *Meconopsis discigera*, *M. grandis*, *M. latifolia*, *M. paniculata*, *M. simplicifolia* and *M. superba* are sharing the honours. In a semi-shaded position, that very interesting plant *Glaucidium palmatum* is at present displaying a number of flower heads, their beauty lying in the four lavender coloured calyx segments which are 3 inches in diameter. With a background of peat a planting of the large flowering New Zealand Buttercup looks very well: botanically it is named *Ranunculus Lyallii*; the large white flowers are produced freely on 2 feet high stems. (Fig. 81.) A nice corner is made by *Disporum Smithii*, which in the autumn has attractive orange coloured fruits. Behind a group of the foot-high white flowered stems of *Diphylleia cymosa* are two more species of *Cypripedium*, both in flower, *C. humile* and *C. pubescens*. *Tiarella trifoliata* and the green flowered *Tolmiea Menziesii* can be seen growing in the shade of some of the taller *Rhododendrons* in the rear. *Incarvillea Delavayi* with its large, rose-pink flowers has an open situation among the dwarfer *Primulas*, also growing well is that recently introduced small shrub *Kalmiopsis Leachiana*, barely 6 inches high, the small rosy-purple, broadly campanulate flowers resemble those of the taller growing *Kalmia* in shape. In a shady spot, *Mitella pentandra* is covering the ground and helps to provide ground cover for the *Rhododendrons* behind. From a crown which was dormant three months ago that native of Madeira, *Orchis foliosa* has produced flower stems, 2 feet high, the numerous purple spikes lasting for some time—a very striking plant. To add to the colour of the peat walls and similarly positioned as their near relatives the Haberleas, *Ramondia Myconi* and *R. serbica* are starting to flower. *Ourisia elegans*, *Primula nutans*, *P. Cockburniana*, *P. luteola* and the red hot poker *Primula*, *P. Viali* are also flowering. *Menziesia purpurea* is still in flower assisting the many *Rhododendrons* now in bloom, *R. Souliei*, *R. neriiflorum*, *R. Aberconwayi* and that lovely shell-pink *R. cyclium* to mention only a few of the newly opened species.

During July and into August the nodding bells of *Daboecia azorica* and *D. cantabrica* look very charming decorating a slope where the flowers are almost at eye level when viewed from one of the paths. Very suitable plants for masking the tails of the peat buttresses as they disappear into the soil, are the *Pernettyas* of which *P. mucronata* and *P. rupicola*, in flower just now, are the best. Small shapely evergreen shrubs, they obscure the wall ends and if planted on top as well as on the bottom they give the impression of being much taller than they really are. *Gaultheria Shallon*, *G. hispida* and *Pieris ovalifolia* are now hanging with bells, the plants of *G. Shallon* being very well adapted to growing in dense shade are planted in places between the *Conifers*. The large pink bell-shaped flowers of *Kalmia angustifolia* are now fully open, as

are those of *K. latifolia*; both these species if properly treated will remain dwarf. The long drooping branches of *Leucothoe Catesbaei* appearing to be weighed down under the weight of the large bells, look very graceful as they stretch out into space from one of the high walls. In contrast is the neater *L. Davisiae*, which produces erect sprays, 2 or 3 feet high, of pure white bells. From Central Europe, *Bruckenthalia spiculifolia*, a dwarf heath-like shrub, is forming carpets of pink not more than 6 inches high. *Meconopsis longipetiolata* with its very finely cut leaves is now in flower as are *M. gracilipes*, *M. robusta* and *M. violacea*. *Orchis praetermissa*, *Philesia magellanica*, that lovely liliaceous shrub with beautiful crimson flowers, and *Habernaria onopsea*, an Orchid of 1 to 2 feet high, are all looking very lovely at this time, so too are *Primula Mooreana*, *P. sphaerocephala*, *Cypripedium Reginae* (Fig. 78), *Meconopsis horridula*, *M. napaulensis*, and *M. villosa*. *Zenobia pulverulenta* a native of the Eastern United States is now adorned with its sprays of sweetly scented bells. It is worth growing this species for the beauty of its leaves alone, the glaucous green bloom remaining all through the season. *Pratia Treadwellii* with its white irregular flowers makes a nice picture as it trails over the ground with its long runners. A difficult *Primula* which is short-lived, *P. scotica*, exists for a time planted in the turf strips on top of the walls, while throughout the area *P. alpicola*, *P. anisodora*, the orange flowered *P. aurantiaca*, *P. Beesiana*, *P. Bulleyana*, *P. frondosa*, *P. Jaffreyana*, *P. saxatilis*, *P. Waltonii* and *P. werringtonensis* keep the colour range wide and varied. In a similar position to *Primula scotica*, *Pyrola rotundifolia incarnata* is spreading rapidly. In the shade of *Vaccinium padifolium*, a rather attractive fern-like plant, *Pteridophyllum racemosum*, is in flower; it is a native of Japan and the white flowers are produced on spikes 9 inches high.

Late summer sees a gradual fading away of the flower masses, most of the Rhododendrons having finished by this time. August, however, brings some very nice late flowers. In the front *Roscoeae alpina*, *R. purpurea* and the white flowered *Parnassia nubicola* give colour as does a planting of *Platycodon grandiflorus* and the feathery flowered *Astilbe simplicifolia* on the slope. The ordinary Heather, *Calluna vulgaris* and its varieties are just starting to bloom, carrying on from where *Erica cinerea* is leaving off, forming bright patches at various levels. Closer in to the wall faces different varieties of Cyclamen are now in flower, *C. europaeum*, *C. neapolitanum* and *C. graecum*, all very lovely species and ideally suited to these conditions. *Swertia speciosa*, *Tricyrtis formosana* and *T. hirta* the Japanese Toad Lily brighten a lower terrace. Carpeting other slopes are *Lysimachia Nummularia*, *L. Nummularia aurea* and *L. nemorum* all completely covering the soil.

Added to many species of the last few months which still persist in flowering are many varieties of the autumn Crocus, *Colchicum autumnale*. *Primula sphaerocephala* and *Tricyrtis pilosa* are added to the long list as the Sweet Pepper Bush, *Clethra alnifolia* and its variety *Michauxii* send out a sweet perfume from their erect white flowering sprays. Situated very obviously on the edge of a terrace are two species warning us of approaching autumn, *Gaultheria Miqueliana* and *G. cuneata* laden with their large white fruits. These plants are barely a foot high and never fail to produce an abundance of these white balls every autumn.



FIG. 67 *Rhododendron* 'Fragrantissimum' in a cool greenhouse at 'The Bush, Milton Bridge, Midlothian' (See p. 156)

FIG. 68 *Maloma lomariifolia* at Highdown, Goring-by-Sea, in January 1950 (See p. 157)
Photo: De Graaf





Photo. Downward

FIG. 69 - *Mahonia lomarifolia* at Highdown, Goring-by-Sea, in January 1950
(See p. 157)



Photo, Deane Ward

FIG. 70—*Iris Hystrix* var. *aintabensis* at Hightown,
Goring-by-Sea, in January 1950 (See p. 157)



Photo, Lutter & Son

FIG. 71—*Iris histrioides* (See p. 157)



FIGS. 72, 73—The Peat Garden at Edinburgh Botanic Garden. (See pp. 145–155)

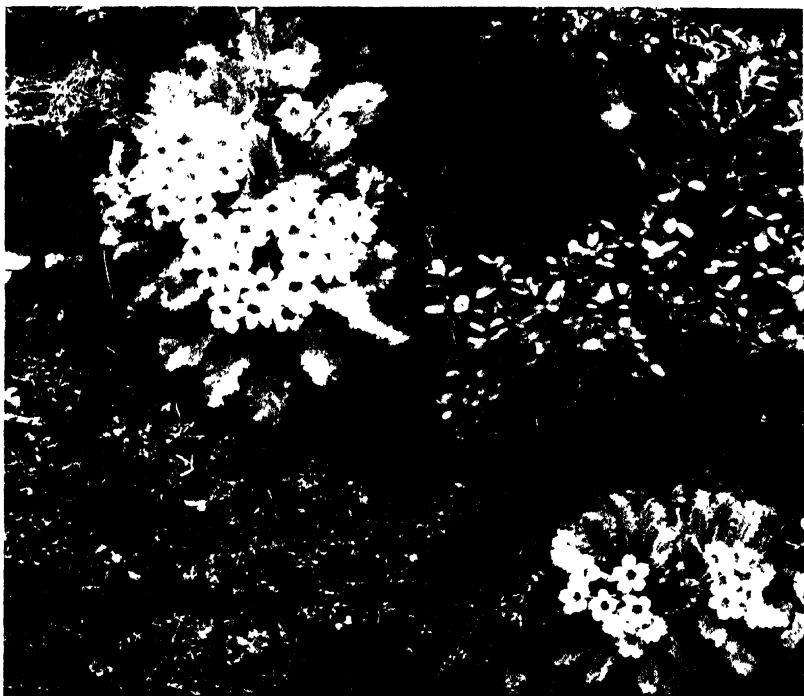


FIG. 74 *Primula bracteosa* in wall face (See p. 149)



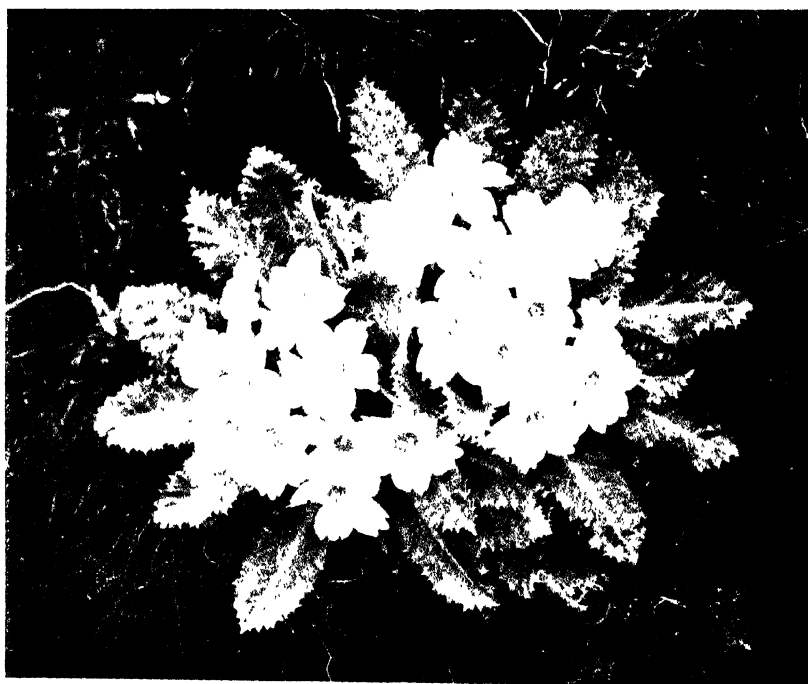
Photos, D. Wilkie

THE PEAT GARDEN

FIG. 75 Grass topped wall with *Primula bhutanica* and *Schizocodon macrophyllus* planted in wall face (See p. 151)



FIG. 76—*Omphalogramma nuttallianum* (See p. 132)



THE PEAT GARDEN
FIG. 77—*Primula bhutanica* (See p. 149)



FIG. 78—*Cypripedium Reginae* (See p. 154)

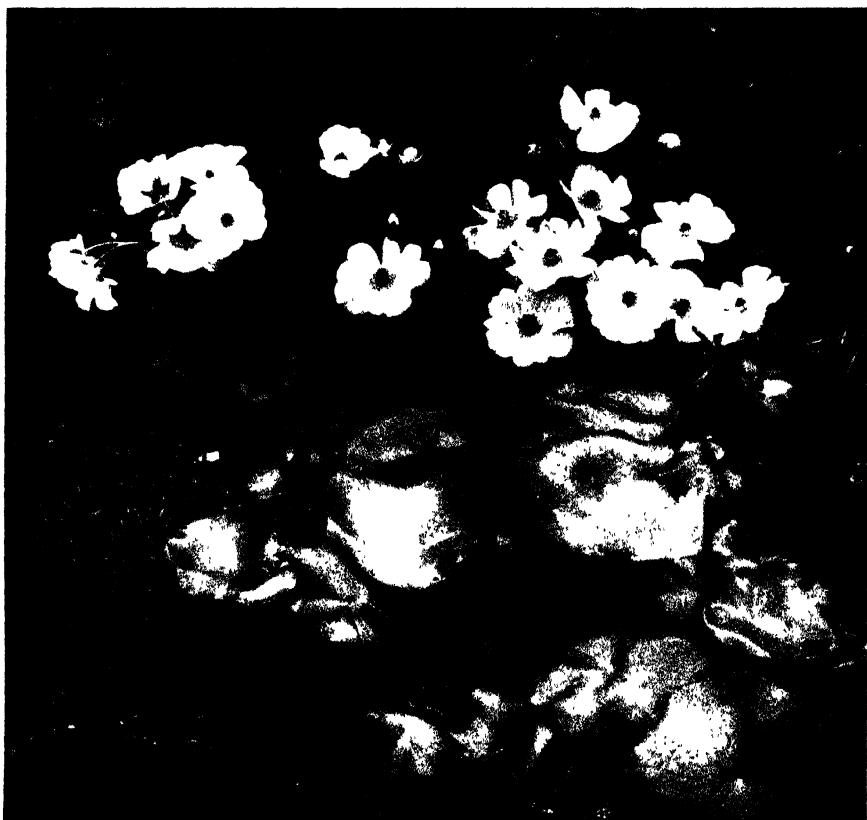


THE PEAT GARDEN

FIG. 79 *Ourisia macrophylla* (See p. 151)



FIG. 80 - *Meconopsis quintuplurella* (See p. 151)



Photos, Royal Botanic Garden, Edinburgh

THE PEAT GARDEN



FIG. 8. — *Magnolia highdorensis* (See p. 159)
(After a drawing by W. J. Popham)



Photo, Malby

SOME CHILEAN PLANTS

FIG. 83- *Tropaeolum speciosum* (See p. 166)



Photos, Collingwood Ingram

FIGS. 84, 85 Camellias growing on the sunny side of the main street in Vico in N.W. Spain (See p. 158)



FIG. 86 *O. disadepophylla* (See p. 167)



Photos. Malby

SOME CHILEAN PLANTS

FIG. 87 *Tropaeolum polyphyllum* at Graytve Manor, East Grinstead (See p. 166)



Photo, Downward

SOME CHILEAN PLANTS

FIG. 88 *Berberis montana* (See p 164)

Autumn shades now really take over the stage from the flowers and for the next two months, the colours of the fruits and dying leaves add a new interest to the area. A small tree of *Sorbus foliolosa* is now hanging with clusters of pinky-white balls. Many of the Gaultherias and Pernettyas, well dispersed over the whole site are showing their coloured fruits. The Gaultherias include, *G. procumbens*, *G. antipoda*, *G. hispida*, *G. Veitchiana*, *G. ovatifolia* with bright red orbs, *G. depressa*, *G. pyrolifolia*, *G. sinensis* and *G. nummularioides*, var. *minuta*, a very dwarf shrub which spreads close to the ground. *Pernettya mucronata* and its varieties are now covered with their globes of many shades, as is the pink-fruited *P. pumila* scarcely 5 inches high. Planted in the face of a high peat buttress, *P. tasmanica* is thriving and at this time is covered with its flat bright red fruits; also very colourful are *P. empetrifolia*, *P. leucocarpa* and *P. prostrata*. A bigeneric hybrid between *Pernettya* and *Gaultheria* is now producing dark purple berries. This cross was made at the Royal Horticultural Society's Gardens, Wisley, between *Gaultheria Shallon* and *Pernettya mucronata* and is known as *Gaulnettya wisleyensis*.

A fine specimen of *Cercidiphyllum japonicum magnificum* is ablaze with colour giving the impression that the base of its background of Conifers is on fire. The leaves of *Vaccinium hirtum* Smalli, *V. parvifolium*, *V. canadensis*, *V. glauco album*, *V. ciliatum* and *V. caespitosum* display a myriad colours. Other plants with bright leaves are *Rhododendron canadense*, *Fothergilla major* with yellow leaves, *F. monticola* with orange ones. *Leucothoe axillaris* and *Oxydendron arboreum*. *Menziesia ciliicalyx*, *M. lasiophylla*, *M. ferruginea* and *M. purpurea* all colour up well as the chlorophyll in their leaves is destroyed. The leaves of *Acer griseum* turn to many warm shades before falling. In contrast to death, this year's glaucous green leaves of *Rhododendron lepidostylum* are conspicuous with their fresh metallic hue.

Except for *Erica carnea* and its many forms, the final month of the year produces nothing beyond what has already been mentioned drawing its colour and interest partly from the preceding month and partly from the following one.

During leaf-fall a regular clearing up of the fallen leaves must be made, or their decomposition *in situ* may destroy the crowns of the dormant Primulas, etc.

The many genera and species mentioned here do not nearly cover the whole range of plants accommodated in the Peat Garden at Edinburgh but rather include a fair cross section of what is grown there. However, I think sufficient has been mentioned from which the enthusiast can make his choice. Many new species are planted in this area, yearly, to test their ability to stand up to these conditions, the winter months being the most trying.

NOTES FROM FELLOWS

Rhododendron 'Fragrantissimum'

WHEN I inherited The Bush, Milton Bridge, Midlothian, in 1933 I found in a large iron framed cold glasshouse two square wooden tubs about three feet square, standing on the thick slate slabs, such as one sees in old wine cellars. These two tubs each contained an old plant of *R. 'Fragrantissimum,'* which I had known for many years and had once seen in flower.

One tub was so decayed that the plant roots were exposed and that plant soon afterwards died. The other tub was also rotten, but we managed to hold it together for the time being. The plant soon responded to a top dressing of good leaf mould and threw out good young shoots the next season.

Previous years' growths had been twisted round the plant, so that upon a foundation frame of dead growth, the new growths were tied into place. We cut out a lot of this dead wood, leaving enough to form an open framework on which to tie in the new growths.

We then made two wooden "window-boxes" filled them with good leaf mould and loam and placed them one on each side of the old tub—raised on bricks—so that we could layer a number of young shoots of the year during the summer.

This was very successful and the next summer we took off 15 well-rooted layers and potted them up, pinching back the leading growth to make them branch.

The next year another batch of layers was put down and was nearly as successful as before. The potted-up layers were sunk in a cold peach-house border and grew very rapidly. Wire balloons of stiff fencing wire were made and the young plants were trained into shape on them. These were soon well covered and the plants began to flower. We then gave the old plant a new tub and renewed much of the soil.

Several of these plants of various sizes have been given away and the gardener, MR. J. CRAIK, has grown on the old plant and the younger generations with special pride, till the result each year is as seen in the photograph. (Fig. 67.) The old plant now greatly improved in health and vigour is seen surrounded by its children. When in flower the scent is delicious and fills the whole large greenhouse.

The secret would appear to be an annual top dressing with good old leaf mould, careful watering and intelligent selection of which growths to cut out and which to tie in and where.

In 1946 Edinburgh University bought the whole property. The Bush has now become the Research Station of the Edinburgh centre of Rural Economy under PROFESSOR J. S. WATSON. They took over these plants and CRAIK our former gardener still cultivates them. The garden stands 600 ft. above the sea and there is no sort of heating in the greenhouse. This suggests that we may say that the plant is hardy under such conditions.

R. D. TROTTER

Mahonia lomariifolia

This *Mahonia* has flowered better this last winter than ever before. The flowers, which consist of erect panicles of deep yellow racemes, stand up well above the large lomaria-like leaves and make a fine show during the winter months. This shrub usually flowers in November, but last winter, owing perhaps to the dry conditions, the flowers were at their best in December and the early part of January. The plants growing at Highdown were raised from seed given me by MAJOR LAWRENCE JOHNSTON in 1936. MAJOR JOHNSTON collected the seed when he went with FORREST on his expedition to Tenguah on the Burma-Chinese frontier, and grew it in his garden at Mentone. *Mahonia lomariifolia* has a somewhat tropical appearance and coming from Northern Burma might not have been hardy in our climate. These plants, however, have withstood 18° of frost and heavy snow without hurt. The tallest shrub is somewhat leggy, growing up to 12 feet, but the others are more compact, making bushy plants some 8 feet high. They are growing on a bank well protected from wind, facing east, in the ordinary chalky loam of this garden. The birds enjoy the berries and take them even before they are ripe. Although the golden yellow flowers have no scent, unlike the flower of *Mahonia japonica*, they are a great addition to the garden, flowering as they do in mid-winter. (Figs. 68, 69.) F. C. STERN
Highdown, Goring-by-Sea.

Iris Histrio var. *aintabensis*

Iris Histrio var. *aintabensis* was originally introduced from Turkey by MR. G. P. BAKER's brother. It was again introduced in 1933 by E. K. BALLS who collected seed on his expedition to Turkey. Under his number 803 he states that he collected seed in May from plants growing among rocks and in vineyards in deep red or dark clay soil, either with or without lime at 3,000 feet. This charming little *Iris* sends up its light blue flowers each year in January in a border facing south in chalky soil. It is as hardy as possible. As long as the ground is not frozen hard, it will flower whatever the weather and it has been known to push up its flowers even through a light covering of snow. It is easy to propagate as it forms small bulbs round the parent bulb, but these are not always easy to find when digging up the bulbs as they are very small and their colour is much like the colour of the soil. *Iris Histrio* and *I. histrioides* are very closely allied, the only difference being in the shape of the flower which is narrower in all its parts in *I. Histrio* than in *I. histrioides*, and in the leaves beginning to show through the ground when *I. Histrio* begins to flower while the leaves of *I. histrioides* usually only show when the flower is fading. (Fig. 70.) F. C. STERN
Highdown, Goring-by-Sea.

Iris histrioides

It has been suggested that a few remarks on the cultivation of this lovely *Iris* may be of interest.

I have grown them outside and also in pots and have come to the conclusion that one gets infinitely more pleasure by the latter method with its hourly contact with their beauty. (Fig. 71.)

In mid-August about eight flowering sized bulbs are potted into 5-inch pots, using the standard potting compost. After potting they are given a thorough watering and the pots plunged rather more than rim deep in a sunny position; here they stay all winter.

During January a watch is kept for the first buds showing, and they are then brought indoors—a pot at a time. In a living room they are soon in flower, where they last about two weeks, and more pots are brought in to form a succession.

As they go out of flower, the pots are again plunged outdoors. As the weather gets warmer and drier, water will be needed, and from early April they are fed with a teaspoonful of a complete fertilizer about each ten days, well watered in.

When the foliage turns yellow the pots are laid on their sides—pot base to the south—and a frame light is placed over them, not a frame it should be noted. Do *not* cut the yellowing foliage off. Here they remain until mid-July when the bulbs are taken out of the pots, sorted and stored until potting time comes again.

It has been suggested that the bulbs split up badly after flowering. There certainly is some splitting, a parent bulb usually goes down to three, occasionally five, but given the treatment here outlined the threes will certainly flower. It seems the secret is the feeding and the thorough ripening.

This season my best pot gave twenty flowers from eight bulbs and that in mid-January and at the moment of writing, second week in February, there are a number to be yet brought in.

For those who have difficulty with them outside, I would suggest that planting is done where the soil really bakes out in summer, otherwise put a pane of glass over them to get a real good roast.

W. P. WOOD

Camellias for Roadside Planting

It is a sad reflection on our national character that varieties of trees which can be safely used for roadside planting on the Continent, would almost certainly suffer depredation if grown under similar conditions in England. For instance, it is inconceivable that a crop of sweet fruiting cherries would be allowed to ripen on the trees if these were growing in the heart of one of our provincial towns. Yet in Vizue, in central Portugal, I have seen them in just such a position laden with luscious-looking black fruit, none of which had apparently been touched by the inhabitants, although many of their lower boughs were well within reach of passing pedestrians. I was informed that the crop would later be gathered and sold for the benefit of the municipality. Similarly, I believe, apples borne on the trees which line so many of the highways in Normandy are likewise never pilfered by the public. In Jerez-de-la-Fontera—the “Sherry City” of Andalucia—orange trees form an avenue in the principal street and their fruit also seems to be entirely immune from molestation. In Vigo, in north-west Spain, the temptation that is offered to, and resisted, by the public is not fruit but flowers. Here, at intervals on either side of the crowded main street, the authorities have planted double white and pink varieties of Camellias. At the time of my visit in early January, only a few of these were in flower

but all were heavily budded and promised a fine display later on. Some of the plants had formed small trees up to fifteen or sixteen feet in height. (Figs. 84, 85.) In view of the general opinion among English horticulturists that Camellias, even in our climate, should always be planted in a more or less shady position, it was of interest to note how well some of them were growing on the sunny side of this Spanish street. Admittedly those which had been given a northern aspect were slightly larger and perhaps happier, than their fellows growing in full sun, but when one considers the fierce heat they must experience during the summer months this is hardly surprising—indeed one cannot help wondering how they can survive at all in such close proximity to glaring white-washed buildings and with a solid concrete covering round their roots. In the Azores, where Camellias are often used as hedge-plants, they are also frequently grown in full sunlight and I have even seen a healthy specimen similarly placed in South Africa.

From what has been said it is clear that Camellias are far more accommodating than is generally supposed. No doubt they will grow faster, and more luxuriantly, in shade, but, given adequate ground moisture, it is pretty certain they will be able to withstand, and perhaps enjoy, all the sunshine they are likely to obtain in England.

COLLINGWOOD INGRAM

THE HIGHDOWN MAGNOLIA

J. E. Dandy, M.A., F.L.S.

× **Magnolia highdownensis** Dandy (*M. sinensis* × *M. Wilsoni*), planta ut videtur hybrida characteribus inter *M. sinensem* et *M. Wilsoni* media, foliorum florumque magnitudine ad *M. sinensem* accedens sed foliorum forma ab illa dissona et *M. Wilsoni* revocans.—*Shrub* up to about 6 m. high, the young branchlets villous; leaf-lamina elliptic or elliptic-oblong, rounded to cuneate at the base, acute or subacuminate at the apex, up to about 19 cm. long and 10 cm. broad, dark-green above and at first slightly pubescent especially on the midrib and lateral nerves, paler beneath and densely greyish-pubescent or -tomentose, with about 7–13 lateral nerves on each side of the midrib; petiole up to about 3·5 cm. long, villous; flowers fragrant; peduncle about 5·5 cm. long, more or less pubescent or villous, recurved; tepals 9, white, the outer 3 elliptic-oblong and about 6–6·5 cm. long, the inner 6 obovate and up to about 7 cm. long; stamens purple-red, about 12–14 mm. long; carpels pale-green, glabrous.—*M. sinensis* × *Wilsonii*? Journ. R. Hort. Soc. lxii: 414 (1937); *M. sinensis* × *Wilsonii* Stern in New Fl. & Silva x: 105, fig. 33 (1938); *M. Wilsonii* × *sinensis* Rehd., Man. Cult. Trees & Shrubs, ed. 2: 249 (1940).—Description drawn up from specimens collected by F. C. STERN in his garden at Highdown, Worthing, West Sussex, on 17 May 1948; type in the British Museum Herbarium. (Fig. 82.)

The above formal description is given to provide valid botanical status for the name × *M. highdownensis* which is being used in gardens, and in the trade, for the Highdown Magnolia.

This beautiful *Magnolia* first came into prominence when it was exhibited by COL. STERN at the Chelsea Show in May 1937, gaining an Award of Merit under the formula *M. sinensis* \times *Wilsonii*? An excellent account of it, illustrated with a photograph, was published by STERN in 1938 in *The New Flora and Silva*, in which he adopted at my suggestion the formula *M. sinensis* \times *Wilsonii*. His plant was one of three seedlings which he had received (with no name attached) in the autumn of 1927 from J. C. WILLIAMS of Caerhays Castle, in Cornwall; and he was given to understand that they had germinated after some long time and that the label of the seed-pan had been mislaid. When the plant flowered STERN at first thought that it might be *M. globosa*, which it superficially resembled, but further examination showed that it did not agree exactly with *M. globosa* or any other known species, and that its characters were in fact intermediate between those of *M. sinensis* and *M. Wilsoni*. This fact, coupled with the circumstances of the plant's origin, in a garden (Caerhays) where both *M. sinensis* and *M. Wilsoni* were grown and flowered, warranted the supposition that the Highdown *Magnolia* is a hybrid between those two species; and this supposition is supported by the further fact that the plant is not represented among specimens collected in the wild state. We can be sure that if a collector such as WILSON or FORREST had met with the plant and sent home seed he would at the same time have collected dried material for the herbarium. The case is somewhat similar to that of \times *M. Thompsoniana*, accepted as a hybrid between *M. tripetala* and *M. virginiana*, which was raised from seed gathered in 1808 from a tree of *M. virginiana* growing in THOMPSON'S garden at Mile End, London, and which was intermediate in characters between the two species named.

The Highdown *Magnolia* is a desirable shrub which has no dislike of chalky soil. In 1938 STERN described the plant as standing about 10 feet high and about the same in diameter; in 1948 he informed me that the tallest example was about 20 feet high, growing in bush-like form. It has the same beautiful flowering qualities as its parent species. In size of leaf and flower it resembles *M. sinensis* rather than *M. Wilsoni*, but the leaf-shape approaches that of *M. Wilsoni* and differs from that of *M. sinensis* especially in the more pointed apex. I am informed that the plant can be reproduced true from seed.

M. sinensis and *M. Wilsoni*, the parent species of \times *M. highdownensis*, are closely related and along with *M. globosa* and *M. Sieboldii* form a distinct Asiatic section of *Magnolia*, for which I proposed the epithet *Cophanthera* in 1936 (Curt. Bot. Mag. clix: sub t. 9467) with *M. globosa* as type. The section must, however, take the name *Magnolia* sect. *Oyama*, proposed in 1933 by the Japanese botanist NAKAI (Fl. Sylv. Korean. xx: 117) with *M. Sieboldii* (*M. parviflora* Sieb. & Zucc. non Bl.) as type.

In a classification of the genus *Magnolia* which I am to present at the forthcoming Conference on Camellias and Magnolias the section *Oyama* is placed in the typical subgenus *Eumagnolia* of SERINGE (Fl. Jard. iii: 224 (1849)), which includes the subgenus *Magnoliastrum* of REHDER (Man. Cult. Trees & Shrubs: 253 (1927); ed. 2: 247 (1940)) minus *M. acuminata* and *M. cordata*. The latter two species find their

natural affinities in REHDER's second subgenus, which he calls '*Gwillimia*' but which requires a valid name as the epithet *Gwillimia* is based on *M. pumila* (*Gwillimia indica*), a synonym of *M. Coco* in the subgenus *Eumagnolia*. I take the opportunity here to name this second subgenus *Pleurochasma**; it corresponds to REHDER's subgenus '*Gwillimia*' with the addition of *M. acuminata* and *M. cordata*.

I am indebted to COL. STERN for specimens of \times *M. highdownensis* and to MR. W. J. POPHAM for the figure, which was drawn in 1948 from a plant at Highdown.

* *Magnolia* subgen. *Pleurochasma* Dandy, subgen. nov., typo *M. Campbellii* Hook. & Thoms.; folus deciduis saepius post flores expandentibus, florum tepalis sub-similibus vel exterioribus multo minoribus calycem simulantibus, antheris lateraliter vel sublateraliter dehiscentibus, fructu cylindrico vel oblongo plerumque distorto. The epithet is a Greek compound referring to the lateral dehiscence of the anthers.

SOME CHILEAN PLANTS CULTIVATED IN BRITAIN

G. W. Robinson

PART I

SOME years ago the writer had the interesting experience of working for a period of five years in the Republic of Chile, and of learning something of the flora of that country. He has naturally retained a keen interest in the Chilean plants which are, or have been, represented in British gardens. Many well-known greenhouse plants, for example *Calceolarias*, *Salpiglossis* and *Schizanthus* are developed from Chilean wild plants, but they are so changed by breeding and selection that it is difficult to realise that the humble wild species are indeed their ancestors. They are indeed very beautiful when seen en masse; *Schizanthus pinnatus*, to single out one species, is as plentiful and as lovely in the Valparaiso District as are Bluebells or Buttercups in Britain. It is, however, an amazing development from the wild plant to the beautiful colour range presented by the hybrids of to-day.

The Chilean Coastline from N. to S. is about 2,800 miles long, and its climatic variation extreme. The country may be said to have four distinct zones:

1. The hot and dry conditions of the North, semi-desert in parts.
2. The warm and sunny central zone which has a restricted rainfall (up to 13 or 14 inches Santiago).
3. The "rainforest" area of the Southern Provinces (Valdivia about 40 inches).
4. The cold and wind-swept regions of the extreme South including Magellan Straits and Tierra del Fuego.

There is naturally an extremely diverse flora, ranging from such true zephyrites as the Cacti and Bromeliads in the Northern Provinces, to luxurious ferns, lichens and epiphytes in the South.

So far as British Horticulture is concerned it is the Central and Southern areas which have yielded the most interesting results, and over the longest period of time. The story of the introduction of Chilean plants to our gardens goes back over a century. Many of the best were collected for the enterprising and famous firm of VEITCH who sent out three collectors to Chile (and other parts of S. America). WILLIAM LOBB made two trips during the period 1840-57, RICHARD PEARCE 1859-62 and G. DOWNTON 1870-73. Other plants were sent home by various Naval Expeditions, and others again by travellers and merchants who settled in the cities and towns of Chile, and sent seeds of interest either to friends or to the Botanic Gardens at home.

Some of these local collectors did fine work over a century ago when travelling in those parts must have been extremely difficult. A MR. CRUICKSHANKS, a correspondent of the Botanic Gardens of Edinburgh and Glasgow, presumably a Scottish business man living in Chile, sent home from 1822 onwards the cream of Chilean herbaceous plants and bulbs including species of *Calceolaria*, *Schizanthus*, *Salpiglossis*, *Loasa*, *Malva*, *Sisyrinchium*, and many others. His name is perpetuated by the *Botanical Magazine*, particularly the volumes from 1823-25, and by *Lupinus Cruickshanksi* an annual which is still grown. A genus was in fact named in his honour but the name is now invalid (now *Balbisia*).

Other names which were perpetuated in the same way and about the same period are MR. CUMING who collected in Chile about 1830, in whose honour the Genus *Cumingia* was named (this also is now redundant being a synonym of *Conanthera*) and DR. GILLIES a resident of Mendoza, who is commemorated by the Genus *Gillesia*. MCRAE who collected for the Horticultural Society was also unfortunate, *Linum McRaei* being invalid as it had previously been named *L. Chamissonis*.

HOOKE writing in 1862 (in *Bot. Mag.* t. 5343) wrote of "Botanists and collectors who have explored a region *so well known to us as Chile*." As to-day, enthusiastic amateurs at home played a considerable part in the cultivation and exhibition of new and rare plants. One of these, MR. WALKER of Arncliffe Grove, Southgate, is frequently referred to in Botanical literature and was honoured by the naming after him of the monotypic *Schizopetalon Walkeri*, a plant which he first flowered about 1823. In the same year MR. FRANCES PLACE of Charing Cross presented a collection of Chilean plants (chiefly bulbs) and seeds to the Horticultural Society. This included *Phycella ignea*, *Amaryllis advena* and *Oenothera acaulis* all of which flowered for the first time at the Society's gardens at Chiswick and were duly figured.

The trees of the rain forest area are for the most part well known, especially in the more temperate parts of Britain. Conifers such as *Araucaria imbricata*, *Libocedrus chilensis*, *Fitzroya patagonica*, *Saxegothea conspicua*, *Prumnopitys elegans* and *Podocarpus*; evergreens such as *Drimys*, *Eucryphia* and *Embothrium* and the interesting, though not too hardy, southern Beeches, *Nothofagus*. All of these and more have been long in cultivation.

It is not with these that I am concerned in the following notes but with the wealth of smaller and perhaps less well-known Chilean trees, shrubs and herbs which are or have been in cultivation in British gardens.

Being most familiar with that system I propose to follow the sequence of BENTHAM and HOOKER's *Genera Plantarum*.

In the Ranunculaceae there are few representatives which are worthy of note. One, however, I well remember, a deep purple-flowering form of *Anemone decapetala*. Never more than a foot high and with flowers only an inch or so in diameter, it is one of the daintiest flowers of Central Chile. *A. decapetala* is distributed throughout the American continent from the Arctic circle to the Magellan Straits but is rarely seen in cultivation. *A. magellanica* from the far south is, however, in cultivation, it has cream or yellow flowers and deeply cut foliage.

Berberidaceae contains some extremely diverse types of plants, including a number of climbers. One of these, *Lardisabala biternata*, is a decorative evergreen with leathery ternate foliage and curious edible fruits. It was introduced from the Concepcion district by GEORGE THOMAS DAVY who was "struck by the singular dark colour of the flowers and beauty of foliage." He sent a living plant to VEITCH's which flowered in 1849 and was figured in the *Botanical Magazine* t. 4501.

The Genus *Berberis* has in recent years received a great deal of attention and has in fact grown into a "specialist" genus, but a number of the earlier introductions are still worthy of their place. *B. Darwinii* is too well known to need any description. It has been with us since 1849 when it was introduced by VEITCH's having been collected in Chiloe, off the southern coast of Chile, by WM. LOBB. After nearly a century it is known and grown throughout temperate climates as a first-class flowering evergreen and a worthy memorial to CHARLES DARWIN, who first discovered it. In 1930 it was given the hall-mark of a good garden plant, the Award of Garden Merit of the R.H.S. *B. empetrifolia* has been in cultivation even longer, having been introduced in 1827; it is, however, rarely grown to-day save in Botanical collections. Dwarf and slow growing, it can be used to advantage on Rock Gardens. Born in Sheffield but of Chilean parents (the two just referred to) we have that indispensable hybrid *B. stenophylla*. *B. buxifolia* curiously enough arrived during the same period (1826) having been collected in the Magellan Straits by another expedition under CAPT. KING surveying the straits, which had a botanical collector named ANDERSON attached. It is, as might be expected, one of the hardiest Chilean species, though it does sometimes lose its foliage in winter. It makes huge masses 10 or 12 feet high and as much through, and is one of the earliest to flower (*Bot. Mag.* t. 6505). The var. *nana* is a well-known and useful Rock Garden shrub with a tight compact habit. Flowering at the end of March when we have relatively little colour its orange flowers are effective. Another of the old stagers is *B. hakeoides* in which the yellow flowers are in close clusters round the stems; it has rounded spiny foliage. Introduced by PEARCE in 1861, it was given the A.M. when shown by VEITCH's in 1901 (*Bot. Mag.* t. 6770). Of those received in recent years pride of place must be given to the species collected by MR. H. COMBER in 1926-27 on the Chilean-Argentine frontier. The finest is undoubtedly *B. linearifolia*. It is an evergreen with narrow foliage and an erect habit up to 7 or 8 feet high with huge sprays of apricot flowers borne in corymbs.

Though named by a noted Chilean botanist (PHILIPPI) in 1856 it had never been in cultivation. By a curious coincidence it was found by MESSRS. GOURLAY and ELLIOTT shortly after MR. COMBER. MR. ELLIOTT described it as "making Darwinii look like a poor relation," high praise indeed. The R.H.S. committees agreed and gave it the highest award, the F.C.C., in April 1931 (*Bot. Mag.* t. 9526). Another Award of Merit plant, *B. lologensis* is a natural hybrid between *B. linearifolia* and *B. Darwinii*, collected near the lake whose name it bears. (This is actually in Argentina but the parents are common to both countries). It is up to 6 feet high and bears racemes of orange flowers; the plant is, as might be expected, extremely variable. Few of the Chileans are deciduous but *B. montana*, *B. chillanensis* and its var. *hirsutipes*, are. *B. montana*, a tall growing species with a compact stiff habit and large golden flowers, though long known to botanists, was only introduced by MR. COMBER. (Fig. 88.) The nearly allied *B. chillanensis* was collected at the same time and was in fact thought to be a form of it, but was later given specific rank by DR. SPRAGUE. It is slightly smaller both in leaf and flower. All these species are beautiful plants both in flower and fruit, the latter being large and jet black with a bloom like Grapes. From MR. ELLIOTT's 1929-30 expedition we have *B. valdiviana* with large, glossy, almost entire leaves, and racemes of golden yellow flowers. MR. ELLIOTT collected it in the Southern provinces and describes it as growing to 15 feet. It received the A.M. in 1939. Another fine species also collected in the South by MESSRS. ELLIOTT and GOURLAY is *B. congestiflora*; it has lovely foliage, soft yellow flowers and grows 6 or 8 feet high. A third species *B. chilensis* is a strong growing shrub 6 or 8 feet high with leathery deep green foliage glaucous on the underside, and armed with extremely strong thorns. The yellow flowers are followed by bunches of black fruits resembling Black Currants. Though collected by MR. ELLIOTT in the South, I have seen this right up in the Central Provinces. *B. crispa* is a species which by all known rules should not be hardy, yet plants at Kew raised from my seed in 1929 are alive and flourishing. It was collected only a few hundred feet above sea level on the coastal hills near Valparaiso, and is, I believe, the only plant of that collection which has survived in the open.

Berberidopsis corallina, nearly related to the above, is a shade-loving plant from the moist woods of Valdivia; it was brought back by PEARCE in 1862. A climbing or twining shrub with leathery heart-shaped leaves, its flowers are produced in July and August. They are deep red and globular, borne on long slender peduncles. It is usually grown as a wall shrub either on E. or W. walls and in peat or leaf-mould (*Bot. Mag.* t. 5345).

An annual Crucifer, which has been known in gardens since 1821, is *Schizopetalon Walkeri*. It is creamy white in colour, fragrant, about a foot in height, and a useful plant for hot and dry situations. It was figured in the *Botanical Magazine* so long ago as 1823 (t. 2379) and *Bot. Reg.* 752. Shrubs are not common in this family but one of the most interesting is *Mathewsia foliosa* which is found in central Chile. I have seen it a yard high and as much through and covered with Stock-like white flowers. The fruits are flat and oval not unlike those of *Lunaria*

rediviva. I sent it to our Botanic Gardens in 1926 but it appears to have dropped out of cultivation.

The Genus *Azara* is not reliably hardy but most of them do wonderfully well in the milder parts of Britain. Their foliage is good and the leaf pattern is interesting in some species, as each large leaf has a small stipular leaf attached. The flowers are merely masses of stamens and yellow, they are freely produced and pleasantly scented. The best known species and probably the hardiest is *A. microphylla* which is worth growing for its glossy dark green foliage alone. It will grow 30 to 40 feet high under favourable conditions but in cold districts is generally grown on a wall. It is also a good shrub for a shady situation or a north wall. It was introduced for VEITCH's by PEARCE in 1861, and there is a variegated form in cultivation. *A. integrifolia*, a common plant in Chile, has been in cultivation since 1832, when it was sent by MR. CUMING to VEITCH's of Chelsea. It was re-introduced by MR. COMBER in 1926 and gained an Award of Merit when shown in 1934. It is larger in foliage than *A. microphylla* with similar lustrous foliage. The flowers are rather small and are produced in February and March. It makes a graceful bush where it can be grown in the open. Two varieties are known, *A. Browneae*, of which there is a fine plant at Kew, and var. *variegata*, the latter being more tender and only suitable for greenhouse cultivation, save in favoured localities. *A. Gilliesii* has larger foliage somewhat holly-like and the axillary racemes of flowers are produced in April and May. They are the most showy and much resemble a "Mimosa." *A. lanceolata*, though found by Darwin and described by HOOKER in *Flora Antarctica* in 1847, has only been in cultivation since 1926 when it was introduced by MR. COMBER. It was given the A.M. in 1931 and figured in *Bot. Mag.* t. 9374. *A. dentata* is, I believe, in cultivation, but I have never grown it.

Calandrinia is a low-growing herbaceous genus and for sheer intensity of colour I know of few plants to surpass it. We have three Chilean species in cultivation, *C. discolor* and *C. grandiflora* being most commonly grown. They are found on the hot sunny cliffs particularly near the coast and are perennial and succulent. They are unfortunately not hardy with us and are treated as half hardy annuals. Both these species are figured in the *Bot. Mag.* in volume 61 and are stated to have flowered first in 1824. *C. grandiflora* is also figured in *Bot. Reg.* t. 1194 from seeds collected by MCRAE.

Abutilon vitifolium received a First Class Certificate when shown by MESSRS. KELWAY so long ago as 1888. It is without doubt worthy of it in those localities where it succeeds, but painful experience (and frost records) prove that it is frequently killed or severely damaged in many parts of Britain. THURSTON in *Trees and Shrubs in Cornwall* records a plant 30 years old and 18 feet high at Falmouth. Given a warm and sunny corner it will usually reach 12 or 15 feet and flower freely, but it is a wise precaution to keep young stock under glass. The flowers are pale blue and up to 6 inches across; a good specimen, however, is striking even without flowers as it has large silvery Vine-like leaves. Another point worthy of note is that it succeeds on chalk. *Malva obtusiloba* has a low bushy habit, not unlike *M. moschata*, with rosy purple flowers. It

was introduced from the Valparaiso district, where it is fairly common, in 1826 (*Bot. Mag.* t. 2787).

It is only when one visits the South-Western counties and sees such plants as *Tricuspidaria lanceolata* used as a windscreen or shelter tree that one realises what we in colder districts are deprived of. Its pendulous, cone shaped, crimson flowers, and dark green acuminate foliage, make it one of the most desirable of shrubs; where it can be grown. In cold districts it is sometimes grown on walls, and seems to do best in a cool and shady position. Native of the South of Chile and the Lake District, it was introduced in 1848 by WILLIAM LOBB for VEITCH's and again later by PEARCE. *T. dependens* has white flowers and is quicker growing. It was introduced by MR. H. J. ELWES in 1901. It has been known as *Crinodendron dependens*. Both species are excellent cool-house evergreens, though they are lime hating. The family to which they belong is Tiliaceae.

A brilliantly coloured and attractive little plant is a golden flax, *Linum chamissonis* syn. *L. McRaei*. From a woody rootstock it sends up tough shrubby stems which branch freely and terminate in dense corymbs of crimson buds which open to rich golden yellow. They have something of the glittering metallic sheen which is so typical of the buttercups, though it is not closely related. It was introduced so long ago as 1864 by PEARCE, he obtained his stock from Lota, on the coast near Coronel, but it is widely distributed in Central Chile, I re-introduced it in 1929. Its vernacular name Retamillo is the diminutive of Retamo, a broom, i.e. Cytisus or Spartium which the plant does resemble in its rough erect habit and narrow foliage. There is a lovely plate in *Bot. Mag.* t. 5474 where it is described as "perhaps the most floribund and most showy of all species of the genus."

One of the most brilliantly coloured Genera of Chilean flowers is *Tropaeolum*; it is one of the genera which the Veichian collectors were instructed to obtain. Two of the best though different in habit are *T. speciosum* and *T. polyphyllum*. *T. speciosum* is a wonderful sight when it has taken possession of an evergreen or Yew hedge, and has clothed it from top to bottom with scarlet. (Fig. 83.) Once established and really happy it is almost impossible to eradicate. The delicate pale green foliage is lovely, and the vivid scarlet of the flowers has few equals for sheer intense colour; these are followed by purple fruits about the size of Sweet Pea seeds. Unfortunately for those in the Southern counties it is far more successful and beautiful in the more humid atmosphere of Scotland and the North and West. *T. polyphyllum* is easier to establish and also does extremely well in the North. It is trailing in habit rather than climbing and is seen at its best when planted in a rock crevice or low wall and hanging gracefully down. (Fig. 87.) In Scotland it is frequently planted in narrow borders round the greenhouses where the tuberous roots get some warmth and protection. The tubers should be planted deeply to be secure from frost damage (*Bot. Mag.* t. 4042). The species has silvery foliage and golden flowers and the variety *Leichtlinii* deeper, more orange coloured, flowers. *T. tricolor* is a dainty little plant which climbs by means of its flexible leaf petioles which act as tendrils. It has scarlet flowers set on long slender peduncles. It was first collected for VEITCH's by G. DOWNTON, and has since been lost and re-introduced more than

once. In Chile it is one of the earliest flowers to appear in spring (*Bot. Mag.* t. 3169). *T. brachyceras* is much like it; equally early and equally graceful, but with small yellow flowers. It can be described as a small counterpart of the Canary creeper *T. aduncum*. It is figured in *Bot. Mag.* t. 3851 and *Bot. Reg.* t. 1926. Another of this collector's finds was *T. azureum* or *violaeiflorum*; this was sent home by several collectors and is noted in *Hortus Veitchii* from the Vale of Quillota near La Campana (the Bell Mountain). It still grows there and at considerably lower elevation than the 4,000 feet which they give. A point of interest noted in *Hortus Veitchii* is that in this genus we find the three primary colours, red, yellow and blue, though the latter is not a clear blue.

The genus *Oxalis* is represented by an extremely diverse selection of species. *O. gigantea*, introduced by MR. CLARENCE ELLIOTT from N. Chile, is a bush 6 to 8 feet high but is not hardy, while at the other extreme both geographically and in point of size is *O. magellanica*, a prostrate carpet-forming little plant with bronzy green foliage and tiny pure white flowers. On the coastal cliffs grow another type, succulent fleshy plants with bright green foliage and golden flowers. One of these, *O. carnosa*, is figured in both *Bot. Reg.* and *Bot. Mag.* (t. 2866) the latter being by far the best plate. It is dated 1828. The *Bot. Reg.* figure is earlier (1825) and was prepared from living plants brought back by MCRAE for the Horticultural Society. One of the most brilliant masses of colour I have ever seen was provided by millions of *O. lobata*, the Dedal d'oro, in a basin which was during the rains a pond, but for most of the year baked hard and dry. It reminded me of the lesser Celandine in a ditch in Britain. Now a well-known Rock Garden plant it produces in early summer little tufts of bright green clover-like foliage which soon disappear. Later, about September, another crop appears together with the clear golden flowers. It received the Award of Merit in 1916 when shown by MR. ELLIOTT. It was in cultivation so early as 1822 when it was figured in the *Bot. Mag.* t. 2386. *O. valdiviensis* is not so well known, but is also an old plant in our gardens, having been introduced in 1826. It has a compact habit and branching stems some 6 to 8 inches high, producing in summer deep yellow flowers. Another species known to all rock gardeners is the lovely *O. adenophylla*. From further south it is hardier than the last named and a good perennial. (Fig. 86.) Its crinkled glaucous foliage, and large rosy purple flowers in May or June are too well known to require description. *O. rosea* is only an annual but is worthy of more general cultivation. It is extremely common in Chile and is always one of the first plants to establish itself after a forest fire (not uncommon in these parts). It has bright green foliage and pink flowers, the leaves are pleasantly acid, much like Sorrel, and are appreciated as a salad. It is again an old plant in cultivation, there are two plates in the *Bot. Mag.* In t. 2413 dated 1823, the flower colour is intense crimson which suggests either a very fine form or artist's licence; t. 2830, however, is much more typical, it is here described as "one of the handsomest, if not the handsomest of this beautiful genus." It has been lost and introduced more than once in the last 100 years, MR. C. ELLIOTT both re-introduced it and cultivated it, to excellent purpose, at Stevenage.

Balbisia verticillata is one of the few Chilean shrubs which are

cultivated in Chilean gardens. The flowers are yellow like an *Oenothera*, but the foliage as the specific name suggests is verticillate, similar in fact to that of a *Galium*. A native of the dry North it is never likely to prosper in our climate. It was figured in 1875, *Bot. Mag.* t. 6170, from a plant grown by VEITCH'S. This plant was named by HOOKER in honour of ALEXANDER CRUCKSHANKS *Cruckshanksia cistiflora*, but the name is invalid.

(To be continued.)

BOOK NOTES

"A Hundred Years in the Highlands." By Osgood Mackenzie. A new and revised edition with an additional chapter by M. T. Sawyer. Demy 8vo. Illus. pp. 221 (Geoffrey Bles.) 12s. 6d.

The gardens at Inverewe on the shores of Loch Ewe in the North-western Highlands are among the most fascinating I have been privileged to visit. On a wild piece of coast near the head of the Loch, Osgood Mackenzie first planted trees, which formed the environment and microclimate of the fine, almost sub-tropical, garden which he developed later there. Since his death, his daughter, Mrs. Sawyer, has carried it on and she has added an additional chapter dealing with the gardens or the policies, as they are called in the North, and following the chapter written on the gardens by Osgood Mackenzie.

There is much in these to help any gardener in the West as well as making envious gardeners in the East. Here are large specimens of *Eucalyptus*, great beds of *Myosotidum nobile*, the rare Forget-me-not from the Chatham Islands, supposedly nourished with extra fish and certainly thriving and seeding on it, probably the largest *Magnolia stellata* in the country, *Mandevilla*, *Lapageria* and *Philesia* apparently happy and growing up the trunks of palms and other trees, *Rhododendron sino-grande* springing up from self-sown seedlings and many other such tender plants. Here the South African and also the Chilean and South American bulbs and tubers such as *Watsonias*, *Crinums*, *Agapanthus*, *Alstroemerias* and *Tigridias* have spread freely into great natural expanses and are left in place throughout the year. It is a very natural garden and that is one of its great charms.

While gardeners will naturally turn first to the two chapters on the policies, the remainder of the book describing life in the Highlands over the last hundred years is fascinating; alas, it is a life which is fast vanishing and so this book is a doubly valuable document, written by a chief of the Gael in every respect, one who was widely observant and interested in everything around him, both wild and human.

P. M. SYNGE

"Hints for the Town Gardener." 36 pp. (London Gardens Society, 20 Buckingham Street, London, W.C.2.) 7d.

"Herbs grown on Town Window Ledges and in Small Gardens." By Maud Buckland. 7 pp. (London Gardens Society.) 9d.

"Flowers and Vegetables without Soil." By A. J. Simpson. 10 pp. (London Gardens Society.) 9d.

"Miniature Alpine Gardens." By Helen G. Nussey. 7 pp. (London Gardens Society.) 9d.

The London Gardens Society aims to contribute to the beautification of London and to provide its dwellers with a creative source of interest by encouraging the growing of flowers, particularly in those parts which are ugly and dull. Enthusiasm and knowledge together can achieve remarkable results despite the usual London handicaps of an impoverished soil and all too little room for gardening. These cheap and handy little booklets published by the Society accordingly supply sound information on how town-dwellers can make the best use of their limited space and facilities. They deal with window-boxes, miniature rock gardens in pans, soilless cultivation on a small scale and town-gardening generally.

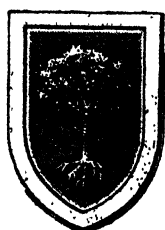
ERRATUM

'Production of Quality in Apples' March Journal, Vol. LXXV, Part 3, 1950. It is regretted that the date of this lecture was erroneously given in the Journal as 29th November, 1929. It should have read 29th November 1949.

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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXXV



Part 5

May 1950

THE SECRETARY'S PAGE

ANNOUNCEMENTS—MAY AND JUNE

Shows, Lectures and Meetings at the Society's Hall

TUESDAY, MAY 2. 12 NOON TO 7 P.M. First day of Fortnightly Show and Rhododendron Show.

3 P.M. LECTURE: "The Gardens at Bodnant" by THE PRESIDENT THE LORD ABERCONWAY, C.B.E., LL.D., V.M.H.

WEDNESDAY, MAY 3. 10 A.M. TO 5 P.M. Second day of Show and Rhododendron Show.

CHELSEA SHOW

TUESDAY, MAY 23. 2 P.M. TO 8 P.M. Private View.*

WEDNESDAY, MAY 24. 8.30 A.M. TO 8 P.M.

THURSDAY, MAY 25. 8.30 A.M. TO 8 P.M.

FRIDAY, MAY 26. 8.30 A.M. TO 5 P.M.

* *Note* : This is a Private View for Fellows and Associates. On receipt of his subscription each Fellow and Associate is sent one ticket with a special detachable portion which alone will admit to the Private View.

Shows, Lectures and Meetings at the Society's Hall

TUESDAY, JUNE 6. 12 NOON TO 7 P.M. } *Iris Society's*

WEDNESDAY, JUNE 7. 11 A.M. TO 5 P.M. } *Show.*

TUESDAY, JUNE 13. 12 NOON TO 7 P.M. First day of Fortnightly Show.

British National Carnation Society's Pink Competition.

3 P.M. LECTURE: "The Cooking of Vegetables" by MONSIEUR F. VINCENT

WEDNESDAY, JUNE 14. 10 A.M. TO 5 P.M. Second day of Show.

Shows, Lectures and Meetings—cont.

TUESDAY, JUNE 27. 12 NOON TO 7 P.M. First day of Fortnightly Show.

Flowering Tree and Shrub Competition.

First day of National Sweet Pea Society's Show.

3 P.M. LECTURE: "The Hybridizing of Lilies: an amateur's approach" by O. E. P. WYATT.

WEDNESDAY, JUNE 28. 10 A.M. TO 5 P.M. Second day of Show. *National Sweet Pea Society's Conference.*

Second day of National Sweet Pea Society's Show.

FRIDAY, JUNE 30. 12 NOON TO 7 P.M. *National Rose Society's Show.*

Demonstrations at Wisley—The following demonstrations will be given at Wisley, that on the second day being a repetition of the demonstration given on the first:—

Vegetable Garden

May 10, 11. Thinning, Transplanting and Successional Cropping.
(2-4 P.M.)

Flower Garden

May 31, June 1. Summer Pruning of Shrubs. (2-4 P.M.)

British Delphinium Society's Show.—Fellows are asked to note that the date of the British Delphinium Society's Show is incorrectly shown on Fellows' tickets and in the Society's Diary. The British Delphinium Society will hold its annual competition in the Westminster Dragoons' Hall in Elverton Street, Westminster, between 12 noon and 6 P.M. on Wednesday, June 28, the second day of a Fortnightly Show. The Westminster Dragoons' Hall is just across the street from the New Hall, at the junction of Elverton Street and Horseferry Road. Fellows' and Associates' tickets will admit between the hours stated above.

ARRANGEMENTS FOR CHELSEA SHOW, 1950

Dates of Show—The Show will be held on Wednesday, Thursday and Friday, May 24, 25 and 26, in the grounds of the Royal Hospital, Chelsea, London, S.W. 3.

Private View—There will be a special Private View on Tuesday, May 23, between 2 P.M. and 8 P.M., open only to Fellows and Associates as shown on their tickets. For details please refer to the paragraph below relating to Fellows' tickets. *In no circumstances, by payment or otherwise, can extra admissions to the Private View be allowed.*

Times—*Fellows and Associates*

Fellows, Associates, and holders of Fellows' Transferable Tickets are admitted free during the following periods:

Wednesday, May 24	8.30 A.M. to 8 P.M.
Thursday, May 25	8.30 A.M. to 8 P.M.
Friday, May 26	8.30 A.M. to 5 P.M.

The Public

Admission on payment may be obtained only during the following periods:

Wednesday, May 24	12 noon to 8 P.M.	Admission 10s.
Thursday, May 25	8.30 A.M. to 8 P.M.	„ 5s.
Friday, May 26	8.30 A.M. to 5 P.M.	„ 2s. 6d.

In no circumstances can admission by payment be gained during the following periods:

Tuesday, May 23	between 2 P.M. and 8 P.M.
Wednesday, May 24	between 8.30 A.M. and 12 noon.

Parties – No reduction in the price of admission can be made for parties of visitors, but tickets may be obtained beforehand to save trouble on arrival. Application, accompanied by a remittance to cover the cost of the tickets required, should be made to the Secretary early in May.

Admission of Children – Children under five years of age cannot be admitted. The charge for the admission of children over five years of age will be the same as for adults.

Fellows' Tickets – A Fellow subscribing 4 guineas annually receives 1 non-transferable and 5 transferable tickets. (The non-transferable ticket has a *detachable* portion admitting the fellow and one friend to the Private View of Chelsea Show.)

A Fellow subscribing 3 guineas annually receives 1 non-transferable and 2 transferable tickets. (The non-transferable ticket has a *detachable* portion admitting the fellow and one friend to the Private View of Chelsea Show.)

A Fellow subscribing 2 guineas annually receives 1 transferable ticket. (This ticket has a *detachable* portion admitting only the Fellow to whom it is issued to the Private View of Chelsea Show.)

An Associate receives 1 non-transferable ticket. (This ticket has a *detachable* portion admitting only the Associate to whom it is issued to the Private View of Chelsea Show.)

Each Fellow's Ticket, both non-transferable and transferable, will admit one person at any time when the Show is open on Wednesday, Thursday, Friday, May 24, 25 and 26, but the non-transferable Ticket may, of course, be used only by the Fellow to whom it is issued. An Associate's Ticket may be used only by the Associate to whom it is issued.

Tickets may not be left at the turnstiles for collection by persons visiting the Show later, but may be posted in the Post Box in the grounds.

Catering – It is regretted that it is not possible to provide set luncheons and teas, but buffets for the service of light refreshments will be available. There will also be separate enclosures for the service of alcoholic beverages.

Post Office and Telephones – A Post Office for the transaction of ordinary Post Office business will be found in Main Avenue, as will also several Public Telephone Boxes.

Band – The Band of H.M. Grenadier Guards will, by courtesy of the Officer Commanding, play each afternoon in the Ranelagh Gardens.

Cloakroom – A cloakroom at which bags, parcels, etc., may be deposited will be situated in Main Avenue.

Invalid Chairs – The arrangements for the admission of invalid chairs will be as follows:

On Tuesday, May 23, Fellows and Associates in invalid chairs will be admitted between 2 P.M. and 8 P.M. on presentation of tickets for the Private View. There will be a charge of 5s. for each chair, and that charge will cover one attendant.

On Wednesday, May 24, no invalid chairs can be admitted.

On Thursday, May 25, invalid chairs will be admitted only between 8.30 A.M. and 12 noon on presentation of Fellows' or Associates' tickets, or on payment of 5s. for the occupant of the chair. There will also be a charge of 5s. for the chair, and that charge will cover one attendant.

On Friday, May 26, invalid chairs will be admitted only between 8.30 A.M. and 12 noon on presentation of Fellows' or Associates' tickets, or on payment of 2s. 6d. for the occupant of the chair. There will also be a charge of 5s. for the chair, and that charge will cover one attendant.

TRANSPORT

Visitors travelling to London will find the following Railway and Bus Services of London Transport operating from the Main Line Termini:—

CANNON STREET (*Railway*). District Line direct to Sloane Square.

CHARING CROSS (*Railway*). District Line direct to Sloane Square. (*Buses*) Number 11 to Lower Sloane Street, Pimlico Road.

EUSTON (*Railway*). Northern Line to Charing Cross, thence by District Line train to Sloane Square.

FENCHURCH STREET (*Railway*). Tower Hill direct to Sloane Square.

KING'S CROSS AND ST. PANCRAS (*Railway*). Piccadilly Line from King's Cross and St. Pancras station to Leicester Square, thence Northern Line to Charing Cross, thence District Line to Sloane Square. Or Circle direct to Sloane Square. (*Buses*) Numbers 77, 77A, to Trafalgar Square, thence Numbers 11 or 39 to Lower Sloane Street, Pimlico Road.

LIVERPOOL STREET (*Railway*). By Circle Line direct to Sloane Square. (*Buses*) Number 11 to Lower Sloane Street, Pimlico Road.

LONDON BRIDGE (*Buses*). Number 10 to Victoria, thence by Numbers 11, 39, or 46, to Lower Sloane Street, Pimlico Road.

MARYLEBONE (*Railway*). Bakerloo Line to Paddington, thence by Circle Line to Sloane Square.

PADDINGTON (*Railway*). Circle Line direct to Sloane Square. (*Buses*) Number 36 to Marble Arch, Park Lane, thence by Number 137 to Chelsea Bridge Road, Royal Hospital Road.

VICTORIA (*Railway*). District Line direct to Sloane Square. (*Buses*) Numbers 11, 39, or 46, to Lower Sloane Street, Pimlico Road.

WATERLOO (*Railway*). Northern or Bakerloo Line to Charing Cross, thence by District Line to Sloane Square. (*Buses*) Number 46 to Lower Sloane Street, Pimlico Road.

BAKER STREET (*Railway*). Inner Circle direct to Sloane Square. (*Buses*) Numbers 2, 30, or 74, to Marble Arch, Park Lane, thence by Number 137 to Chelsea Bridge Road, Royal Hospital Road.

No facilities for cheap travel for parties of visitors are available.

Sloane Square Station is about 800 yards from the Main Entrance, the way being via Lower Sloane Street and Royal Hospital Road.

WISLEY IN MAY

FOR those who are seldom able to visit Wisley, and for those who have not been before, no month can be more strongly recommended than May, when there is a greater variety of plants in flower than at any other season. It would not be possible to see all there is in a single visit, but by following the route suggested in the 'Guide to Wisley Gardens' a good general impression of the layout could be gained and no feature of importance would be missed.

One of the chief attractions at the present time is the Lilac collection. Over a hundred different varieties and some species are planted in Howard's Field, where, despite poverty of the soil they usually flower very freely. Howard's Field is rather remote from the main entrance to the Gardens; but by taking the path leading northwards from the Temperate House, past the Azalea garden, where the old-established bushes will be full of bloom, and across Seven Acres as far as the River Wey, one reaches a pleasant grassy path through the Pinetum. The earliest Lilacs to flower are 'Mirabeau' and 'Lamartine,' but there are many of greater merit to follow. Some reliable ones are 'Souvenir de Louis Spaeth,' with long, deep purple trusses, and 'Massena,' with unusually large individual flowers of a redder hue. 'Madame Lemoine,' no longer a novelty, is still among the best double whites, and 'Vestale' holds its shapely trusses of single white blossom well above the foliage, and is less discoloured by bad weather than some. Then there are others of uncommon colour or form, such as the clear, blush-pink 'Macrostachya,' and the bright rose-coloured 'Maréchal Foch,' with loose, open panicles.

One may return by the main walk through the Pinetum to Seven Acres, where the shrubs in flower include many different Barberries. The majority of these are most ornamental in fruit, but several are worth planting for their flowers. *Berberis verna*, for example, has arching branches set with numerous pendent yellow racemes, and *B. montana*, which has large, orange and gold blooms freely produced among fresh green leaves, is one of the very best of its genus. That most excellent evergreen hybrid, *B. stenophylla*, raised nearly a century ago from a cross between *B. Darwinii* and *B. empetrifolia*, has produced a number of seedling forms reverting more or less to one or other parent. Some of these are low-growing, compact plants very suitable for the front of the shrub border. *B. verruculosa*, usually regarded solely as a foliage plant, is now bearing comparatively large, primrose-yellow flowers contrasting agreeably with its dark, lustrous leaves.

Several flowering trees are worth noting. The Exochordas are among the most graceful, and their large, racemed flowers are of purest white. Almost every twig of the Flowering Dogwood, *Cornus florida*, bears at its tip a minute flower-cluster surrounded by four white, petal-like bracts, even more lovely in the variety *rubra*. *C. Nuttallii*, which has usually six much larger bracts, is represented by a young tree near the round pond, but it is often somewhat disfigured by late frosts at Wisley and is, on that account, less satisfactory than *C. florida*. *Halesia carolina*, the Snowdrop Tree, draped with creamy bells,

Magnolia cordata, a yellow-flowered American species related to the more familiar Cucumber Tree, and the curious graft-hybrid *Laburno-cytisus Adami*, are among the other interesting trees.

In the Wild Garden there is a wealth of Primulas, Welsh Poppies, Lilies of the Valley, Bluebells and the arching white sprays of several forms of Solomon's Seal, together forming a multi-coloured carpet beneath the flowering shrubs. *Magnolia Sieboldii* will be carrying a succession of sweetly scented pendent white flowers, enhanced by a boss of crimson stamens, in company with *M. Wilsonii*, larger in flower and taller in growth, joined later in the month by *M. Watsonii*, the heavy odour of which is widely diffused, especially towards evening.

The greatest mass of colour is, however, provided by the tall specimens of some of the old hybrids of *Rhododendron ponticum*, which give admirable shelter to more valuable things. From the upper slopes of the rock garden one can see the tops of these old trees, massed with bloom in white and many shades of red and rose, among the pale verdure of the oaks.

There should be plenty of interesting flowers in the Rock Garden this month, although, as we pointed out before, many are newly planted and in consequence may not be flowering with typical freedom. Aubrietias, Saxifrages and varieties of Phlox will still be prominent; Penstemons such as *P. Scouleri* and *P. Newberryi* with lilac and cerise flowers, *Cytisus kewensis*, with long trails of primrose-yellow, *Roscoeacautleoides* with Orchid-like flowers of a similar shade and the rich purple *R. Humeana* are among others in flower now.

On the margins of the long pond, where the great clumps of Royal Fern are unrolling their fronds, will be found many of the moisture-loving Primulas, including the mauve *P. yargongensis* and many of the Candelabra section, and the double form of *Caltha palustris* is covered with its tight little golden rosettes. Near the Wisteria-covered bridge the first flowers of *Iris laevigata* in rich blue-purple will be opening towards the end of the month. Several varieties of this species are grown but none has the beauty of the type.

In the Alpine House the arching white panicles of the varieties of *Saxifraga Cotyledon* are very conspicuous, forming a background for a great variety of smaller plants. The neat, long-lasting carmine, pink or white flowers of *Rhodohypoxis Baurii* make it a general favourite, and some others which always command admiration are the large-flowered soft rose *Phlox mesoleuca*, *Erinacea Anthyllis*, the Hedgehog Broom, with lavender flowers among grey-green spine-tipped shoots, the delicate *Oxalis adenophylla*, which has wide, lilac blossoms and quaintly folded, many-parted leaves, and *Globularia bellidifolia*, a green mat of foliage supporting numerous powder-blue flower-heads.

A visit to Battleston Hill will be rewarded with plenty of interest. The Kurume Azaleas, planted to form a carpet, the very hardy *R. malvaticum* × *Kaempferi* hybrids, and the deciduous Azaleas in the Trials will all be at their best. Nearby, in the hardy hybrid *Rhododendron* Trials, Fellows may make their own choice with every confidence of success in a lime-free garden. Over the public footpath, by either of the two bridges into the woodland garden, is a wealth of the choicer

Rhododendron hybrids, the majority grown from layers of the original plants. *R. discolor* hybrids will be prominent, and 'Lady Bessborough' (stone cream), 'Angelo' (a huge white with green blotches), 'Ladybird' (a lovely pink), 'Avocet' (a sweet-scented *R. Fortunei* cross), 'Albatross' (a descendant of *R. × Loderi*, equally large and beautiful), together with the best *R. × Loderi* forms, should all attract attention.

In the Trial Grounds the first of the tall bearded Irises will be opening. The collection now includes some of the newer American varieties, which exhibit some striking colour-combinations, but these have not been planted long enough to make their maximum display. Among the remainder there will be such favourites as the golden 'Joan Lay,' 'Great Lakes' of clear light blue, and 'St. Osyth' of palest blue.

PRESENT-DAY PROBLEMS OF THE HORTICULTURAL INDUSTRY

F. A. Secrett, C.B.E., F.L.S., V.M.H.

LATE ADVISER ON VEGETABLE PRODUCTION, MINISTRY OF AGRICULTURE

*(A lecture given before the Royal Society of Arts and reprinted by
kind permission of their Editor)*

H. V. TAYLOR, C.B.E., D.SC., A.R.C.S., V.M.H., *formerly Commissioner of
Horticulture, Ministry of Agriculture, in the Chair*

I PROPOSE to speak upon some of the problems confronting us from within and without. I shall deal this afternoon with my theme under three main headings: first, Equipment; secondly, Research; and thirdly, Labour. In conclusion, I shall include one or two subjects which are not covered by the three main headings, leading up to a summary of the remedies which, in my submission, are essential.

During the war period the Ministry of Agriculture, in close collaboration with the National Farmers' Union, guided the industry from normal peacetime production to that of an increased supply of vegetables and other essential food. By 1944 horticultural crops were raised on one-thirtieth of the total area of land used for all agricultural purposes. As a result, vegetables were in goodly supply and remained unrationed throughout the war period. This expansion in vegetable crops was inspired, guided, propelled, and made possible from first to last by the resource, temper, and skill of all concerned under the presiding office of the Minister of Agriculture.

Since the end of the war, owing to uncertainty as to Government intentions, there has been anxiety and bewilderment among all growers, with nervous scrutiny of the future. County Agricultural Executive Committees, acting as the agents of the Ministry, require a certain standard of efficiency from every grower. Each holding is graded by merit and if a grower fails to reach the set standard he may eventually be dispossessed of home and holding.

EQUIPMENT

Efficiency is largely dependent on modern equipment such as suitable sheds, glasshouses, machines for cultivating, grading, washing plants, and adequate supply of water, sufficient cottages and canteens, and packing materials as good as those used for our foreign imports.

In 1938 I purchased a dairy farm of 190 acres at Milford, near Godalming, which has since been extended to 350 acres. The fertility has been raised considerably and it is now suitable for the cultivation of choice vegetables and flowers. This involved the outlay of much capital and I believe my own experience to be typical of the industry as a whole. Progress was held up by the war but has since been resumed. Only those who have endeavoured to make such developments in post-war years will appreciate the frustration and heartache caused by controls and planning.

The total of capital invested in horticultural industries must be a vast sum, as that invested in the glasshouse section alone represents over fifty millions sterling. The cost of erecting one acre of glasshouses to-day including heating and other equipment, is not less than £12,000, and the comparable figure before the war was £4,000. (In neither case is the cost of the land included.) The cost of covering an acre with Dutch lights and watering equipment is over £2,000. To establish and equip a modern intensive holding (with a small area of glass for protecting and forwarding plants) costs from £250 to £300 per acre, including the land and irrigation. It is doubtful if land can be planted to top fruit (pears, apples, and plums) at less than £300 per acre, if the cost of the land and the waiting period between planting and bearing are included, as they should be.

Lay Out.—At Milford hedges and trees were removed and high banks were levelled; waste land was brought into cultivation and so the maximum floor-space for crops was obtained, for unproductive land increases the overhead costs.

Good roads are important on a horticultural holding, as heavy ton-nages have to be moved throughout the year. Earth roads take a heavy toll on labour and machinery; concrete roads are essential on certain soils. Initial outlay is high but this is balanced by the low cost of maintenance and the increased speed of movement.

Buildings and Fittings.—Few farm buildings are suitable for market gardens. Some are adaptable but, in the main, sheds should be designed to relieve manual labour. All loading should be done from a platform and conveyor belts may be used with advantage. Packing sheds should be equipped with washing and grading machines and particular attention should be given to lighting, both daylight and artificial. This entails the installation of heat, water, and power. (Figs. 99–102.)

Glasshouses and Forcing Sheds.—Glasshouses and forcing sheds play an important part in the successful running of an intensive holding. They provide work for the labour during the winter months when outside work has been brought to a standstill by climatic conditions. Out-of-season produce always finds a ready sale, improves the grower's prestige, and ensures a continuous source of income to meet the weekly wage bills. (Fig. 96.)

Cold Lights and Cloches.—During the last three decades there has been a great development in the use of cold frame lights and cloches. This type of culture has now become very popular as it gives scope to imagination and thoughtful planning, and this is one branch of horticulture where there is still room for expansion. Available capital limits the work and it is usually expedient for this type of culture to be practised as a branch of general vegetable production. (Figs. 93, 97 and 98.)

Irrigation.—Equipment to secure an adequate water supply is most important, as a limited supply makes a grower dependent on the weather. Without water crops perish; if it is available only in small quantities or applied too heavily crops are liable to suffer from pest and disease. The equipment for an irrigation system varies from holding to holding, and is largely controlled by the source of the water supply. Firms, fully qualified to advise on this subject, specialize in equipment and lay-out, but little research has been attempted on the use of water, and this will be referred to presently. (Figs. 91, 92 and 95.)

Tractors.—Tractors, row-crop tools, and spraying machines all play important parts in the efficient working of a holding. More attention is now being given to correct and thorough cultivation and to the control of pests and diseases. For horticultural work track-laying machines are preferable, as there are many occasions when a wheeled tractor is useless. In spite of all recent developments in machines horses are still essential on horticultural holdings, especially where irrigation is practised, as there are so many occasions when heavy tractors cannot be used after watering. (Figs. 103 and 104.)

Cottages.—Housing shortage has caused many market-gardeners to erect their own cottages for key workers; with the addition of roads and services another heavy capital expenditure is involved.

General Costs.—Apart from the capital necessary for development, since 1938 the cost of materials has risen sharply. For example, the cost of seed has increased by 300 to 400 per cent.; labour charges are up by 170 per cent.; cattle manure is 300 per cent. higher; and the cost of wooden crates has risen by at least 400 per cent. Crates which could be purchased for 10*d.* before the war are now 3*s.* 9*d.* Organic fertilizers cost £30 to £45 per ton against a pre-war figure of £10 to £15 per ton.

These few examples will be sufficient to enable the thinking man to refute the accusation so often levelled against growers that their prices are too high. Nothing works such havoc with the truth as sweeping generalizations like this one. The various items of capital expenditure enumerated, which are common in horticulture, serve to place this industry in true perspective. Market growers are among the world's hardest and most efficient workers, and have earned their right to just and sympathetic treatment.

RESEARCH

Research, advisory work, and education all play their part. Progress has been made during recent years, but the work has been hampered by the acute shortage of fully qualified scientists and research workers. Horticulture now has the same status in the advisory service as general agriculture. In the past many crops were lost through the apathy of the

grower, his lack of knowledge, and failure to diagnose disease in its early stages, remedial action was consequently belated and useless. The advisory service is now available to all growers, and the adviser comes not as a critic but as a friend, who has the whole of the provincial staff at his service. The industry owes a debt of gratitude for the pioneering work that has been accomplished in the establishment of this service. As growers become more conscious of the benefits to be derived from science and research, the standards of production and of general hygiene on their holdings will be raised. Approach to the small grower would be simplified by more visual examples of the work on other farms such as the film of marketing which has been prepared at Milford.

No knowing and impartial observer would deny that the enlightened policy adopted by the Ministry of Agriculture will bring great benefits to the industry and to public health by general improvement in fresh salad and vegetable supplies. Direct research is carried on by the research worker or the progressive grower on the farm. Analogical research is conducted in the laboratory. Its purpose is to test, to illustrate, to interpret or expand, the lessons that have been learnt by direct research on the farm, or to explore the paths which such direct research has suggested. There is an overriding need to test and correct our practices by the scientific method, whether the approach be to new problems or to the fresh investigation of old ones.

*Rumour is a Pipe
Blown by Surmises*

and it may well be—let us indeed hope that it is—a false alarm that H.M. Treasury projects cheese-paring in our Horticultural Research Stations. Such a step would resemble rather the desperate act of a spendthrift in suspending the payment of his fire insurance premiums than good husbandry of our productive resources. I prefer not to dwell on such a catastrophe, but to turn again to what has actually been accomplished and had recently been planned in this country.

Land has been bought at Wellesbourne, near Leamington in Warwickshire, for the National Vegetable Research Station. A Governing Body has been appointed and work has started in earnest under the inspiring direction of DR. PHILP. In addition, land has been bought for experimental stations in Hampshire, Worcestershire, Yorkshire and Lancashire. In the South-Western region problems are so different from those prevailing elsewhere that it is intended to establish a separate station, and steps are being taken to acquire suitable land. These experimental stations will all co-operate and demonstrate the results of research work done at Wellesbourne and they should lead to a much greater spread of knowledge.

Land has also been bought at Merryworth in Kent for National Fruit Trials, and this work is being transferred from less suitable ground in the Royal Horticultural Society's Gardens at Wisley. Research on flowers is being dealt with at Kirton in Lincolnshire, and research on mushrooms at Yaxley near Peterborough.

The development programme includes a new Glasshouse Station. The present comparatively small station at Cheshunt, under the direction

of DR. BEWLEY, has contributed most valuable research work, but it is inadequate for the needs of the Glasshouse industry. Research relating to flower production will also be dealt with by the Glasshouse Station.

This is a comprehensive programme involving heavy capital outlay, since laboratories, glasshouses, and other equipment must be provided, together with dwellings for the research staff and manual workers. The initial cost will admittedly be high, but in a few years it should prove a valuable national investment. At this critical stage the whole industry pleads that development should not be shelved until some future date. Now that these sites have been bought they should be promptly equipped or no one will be benefited. In many branches of horticulture we have floundered too long in the mist and fog of empirical knowledge with its concomitant of continual waste.

I attach cardinal importance to high standards of cleanliness of food shops, and growers can assist by giving close attention to cleaning, grading, and packing. Vegetables are still living when in the markets and they continue to breathe out carbon dioxide. If this gas cannot escape from cellophane-wrapped packages, damage is done. Many distributors will not handle such sealed packages because their contents deteriorate so quickly. It is not true that growers are against progressive methods, whether in cultivation or in marketing; but let us first make sure that new methods proposed are really progressive.

Irrigation.—Though irrigation equipment has been studied by private firms, there has been no systematic research on the proper use and application of artificial rain. I have had the opportunity of watching scientists from Rothamsted working on the irrigation of sugar beet on my farm at Milford and I have been impressed by my own lack of knowledge on this important subject. On balance, I am strongly in favour of artificial rain, but before we determine its correct application we should make full allowance for the fact that natural rain is warmed and aerated by its passage through the atmosphere. The physical characteristics of cold tap or well water are consequently very different from those of natural rain with its high oxygen content.

We also need to know considerably more of the properties of dew, for its penetrating powers are noticeably greater than those of rain. If we could imitate the effect of natural dew during the hours of darkness and in the early morning this would probably do more good than a heavy application of tap or well water. Dew supplies water to the plant without any loss of soil temperature, and it also seems to have a stimulating effect on growth. If the necessary investigations can be continued it may well be that in a few years' time spraying equipment from the irrigation plant will even be used for the control of May frosts on fruit trees. It has, indeed, been affirmed by foreign research workers that it is possible to give protection against night frosts with temperatures as low as 14° F. or 10° C. below freezing point. This would be done by creating and maintaining a fine veil of moisture suspended in the atmosphere, so that the plant or tree would be entirely covered with little beads of water. Complete atomization is essential for the success of this work. Just imagine what a saving of fruit and vegetables could be effected by research progress in this one field alone! It would be unwise

to cut down research work which would eliminate waste and increase production when we are confronted with almost insuperable difficulties in finding dollars to buy food in some markets.

During recent years trace elements and fertilizers have been applied to plants and trees by spraying the leaves or branches with water in which minute quantities of these materials have been dissolved. There is little doubt that the most efficient method of applying fertilizers is in solution; much smaller quantities may be used than when they are applied dry, and results more than justify the experiment.

In a sentence, we are in urgent need of help from the research worker for guidance on the quantity, the time and rate of application, the temperature and aeration of water, on its possibilities as a medium in applying trace elements and fertilizers, and on many other matters.

Soil Fertility.—Let us now turn from irrigation to soil fertility. Possibly there has been a larger amount of research work in this subject than in many others, but the *humus* versus *inorganic* controversy still rages. On the one side we have extreme statements to show the adverse effect upon health caused by the use of inorganics, and on the other side equally forceful arguments on the value of inorganics.

Let us at once clear the ground by admitting, as indeed horticulturists always have done, the importance of keeping the soil in proper physical condition. No soil can be kept "in good heart" without repeated application of humus in some form, since humus leads to development of soil micro-organisms, holds moisture, promotes aeration, encourages earth worms, and provides the best conditions for root development. It is in line with nature's age-old law of life to decay, and from decay to life again—a law which cannot be broken without penalty.

The food of plants is obviously not limited to nitrates, phosphates and potash, for they need many other substances, some perhaps unknown and some in very minute quantities, but their total needs appear to be supplied by good stable manure or natural humus. The rival merits of the organic or the inorganic fertilizer continue to vex the minds of growers, but possibly the truth lies midway between the two schools of thought. Be this as it may, where much humus is regularly applied there is, invariably, comparative freedom from pests and disease.

The degree of soil acidity is important since it may influence the quality and nutritional value of the vegetables produced. Acidity is caused in the main by poor cultivation, lack of good drainage and an excessive use of inorganic salts—in short, by an incorrect physical condition of the soil. Now that doctors and scientists are so keenly concerned with safeguarding public health, it is hoped that joint research may be extended to include consideration of soil fertility in relation to their own problems.

Weeds.—The work of DR. BLACKMAN on the subject of controlling weeds by chemical sprays has been of great value, but much care is necessary when spraying is practised and many growers have not ventured as yet to adopt this method of control. Thorough, correct cultivations and the maintenance of soil fertility change the type of wild flora

and may provide an answer to the weed problem, which should be eradication rather than control.

When I purchased my farm at Milford, the chief weeds were cat's tail, spurrey and mare's tail; but as fertility was improved by cultivations and applications of humus these weeds died out and were replaced by groundsel, grass and chickweed. The land has now reached the stage where it produces dwarf stinging nettles in profusion, a sign of very high fertility. At this stage, if care is taken to prevent weeds seeding, and all humus applied has been heated to a point where weed seeds are destroyed, there is in my experience no reason why any crop should become weed-infested.

After a crop has been sown or planted cultivation is continued with row-crop tools and hand hoes for moving the soil round the plants. This provides better aeration, more warmth, and checks the loss of moisture. These operations all tend to stimulate growth during the early part of a plant's life which is the most important time. The continual use of sprays often causes hoeing to be neglected, and this is a serious loss to the plant, also the use of certain sprays has a temporary depressing effect on growth. How much need and scope for research these problems afford!

Much that I have said on the use of sprays against weeds applies also to insecticides whose prodigal use may lead us into serious trouble. For example, since D.D.T. has been used extensively blue-cabbage Aphis infection has increased perceptibly, and it is obvious that in our ignorance we are liable to destroy beneficial insects by attacking others. If the pH of the soil were maintained at between 6 and 7, this would do much to deter leaf-sucking insects; acidity is as harmful to some plants as to the animal kingdom.

Mechanization.—This can be divided briefly into two sections:

(a) Complete mechanization of the farm, even at the expense of yield, with the sole aim of replacing manual labour.

(b) Making as full use of mechanical implements as is compatible with producing the maximum yield of which land is capable.

Both methods are closely linked with costs but, in general, we should be concerned with production cost per ton, not per acre. The cheapest way to reduce costs is by increasing tonnage, and this can only be done by maintaining maximum plant population per acre. In this respect our country has much to learn from continental growers. High tonnages and first-class quality are usually found together, and their close association makes the need for further scientific investigation a matter of vital importance.

Stocks and Seeds.—For many years this industry has been well served by the large seed houses in this and in other countries, by the introduction of new varieties, and by the selection of improved strains, yet there is great need for additional research, and investigation on a national basis. During the last few years virus diseases of plants have much increased, and to-day it is, for example, difficult to find a clean stock of Lettuce. An entirely new disease has recently appeared in Cauliflower; some suspect virus, others consider it is caused by a trace element

deficiency. Many existing stocks and strains of vegetables need purifying. Investigation must commence with stocks which are available and in use, and for this purpose a variety testing station will be needed. The necessary arrangements have been made for this work to take place at Paglesham, in Essex, under the direction of the National Vegetable Station.

LABOUR

Unless adequate labour is available all other expenditure is wasted. Although a machine may replace man-power on the production side, to a certain extent the industry will always be dependent on hand labour all the year round for the gathering, harvesting, and grading of produce. The market-garden differs in this respect from the general farm, where harvesting is now mechanized and is confined to definite periods of the year. (Fig. 94.)

It is evident that shortage of labour will be one of our industry's greatest problems in the near future. Before the war many women from the towns appreciated seasonal labour on a holding, but better home conditions and improved facilities have curtailed this old periodical exodus. During the war-period the Agricultural Executive Committees and the Women's Land Army fulfilled a vital need, for at least 60 per cent. of the labour from both sources was employed in horticulture. What does the future offer? The Women's Land Army is to be disbanded in November, and in 1951 Committee labour will cease. From a recent statement by representative of the Ministry of Labour there is no prospect of emergency labour becoming available through Labour Exchanges in the near future.

No doubt many of the Women's Land Army girls will wish to continue on the land where they have proved both keen and efficient, and very happy in their work. Unless good accommodation can be found to replace the hostels in which they now live, many well-trained girls will be lost to the industry. The Minister of Agriculture recently stated that consideration will be given during coming months to this problem, so as to ascertain whether any special provision should be made for the welfare of ex-Women's Land Army members who remain on the land after 1950, but the matter is one of urgency, for both hostels and cottages will be needed. At the present time building by private enterprise is forbidden, and in many districts the allocation of Council houses for agricultural workers is unsatisfactory. It is really essential that licences be granted speedily for building agricultural hostels and cottages which will be additional to the quotas allocated to local authorities, of course, subject to the support of the County Agricultural Executive Committees acting for the Ministry of Agriculture.

CONCLUSION

Distribution and Marketing.—Within the industry there is a wide divergence of opinion on distribution and marketing. It is, perhaps, pertinent to recall that in 1920 the Linlithgow Committee's report on Covent Garden did not reveal any exorbitant profits in distribution. In any case, it is impossible to envisage the introduction of a comprehen-

sive marketing scheme to include all produce, since in the vegetable sector alone there are some 45 types in common use, and each type may embrace 10 varieties. If we limit the varieties to 6 grades we have the unworkable figure of 2,700 different commodities in the vegetable sector alone. The inclusion of the fruit and flower sectors would, in my considered opinion, reduce the inauguration of a single scheme to an absurdity. Nor should it be overlooked that, behind the system of marketing which has been gradually evolved by trial and error under private enterprise through the last 100 years, there lies the governing factor that vegetables are of a highly perishable nature and a certain percentage of purchases by the retailer must as a rule be written off. Any dynamic change of method would result in chaos; much more would be achieved by improved methods of transport. Any alterations in the present system of distribution should be gradual, but central markets must be retained at key points to serve the industry as general marshalling yards for the whole range of produce.

It is really far wiser to pin our faith to education, research, and advisory work than to rely on compulsory and arbitrary control of marketing boards. High quality produce must be grown before it can find its way into packages, and as a general rule a grower producing high-grade produce is a good packer, provided always—and the proviso is important—he can obtain the requisite materials. During recent years we have witnessed development of voluntary collective organizations to assist with grading, packing, and distribution, especially in the fruit sector. They have brought benefit to all concerned, and similar organizations are now being established for vegetables in areas where there is heavy production, such as in Cornwall and Hampshire. These admirable schemes are so much nearer to the natural instinct of a husbandman than dictation or arbitrary controls, and they provide the small grower with services similar to those enjoyed by the large grower.

Another recent and happy development has been the large displays of produce and sundries. The Western Commercial Show at Penzance was the pioneer, followed by the Early Market Produce Show, held annually by the Royal Horticultural Society at Vincent Square, and later by the Market Produce Show at Southampton. These shows are of great educational value to the grower, while the consumer has a visual demonstration of what British produce is available and how high a standard it can attain.

Transport.—Service given by the railways in transport of perishable produce was improving year by year until the war. It was possible to load on fast goods trains in London during the early afternoon for delivery in the Northern and Scottish markets before 6 A.M. the following day, and direct and rapid services were available from such areas as Cornwall. Now, unfortunately, produce is often 48 hours old when offered for sale, and in many cases growers have had to resort to costly passenger services or road transport in order to ensure delivery in the early morning of the following day.

Political arguments have been avoided in this paper so far, and attention has been focused on the compelling need for the dissemination of expert knowledge in every sphere of activity from the seedbed to the

market and on the deterioration of railway transport, but one aspect of our present quandary must be underscored. This is the deliberate depression of prices for home-grown produce by the importation and dumping of continental fruit and vegetables, often when home-grown produce is in abundant and cheap supply. The British grower neither receives nor seeks subsidies; indeed under recent legislation he is subject to all the penalties imposed upon farmers, but he receives few of their special privileges. It is pertinent to recall that wages in this country are 16 per cent. to 20 per cent. higher than those prevailing on the Continent of Europe. The Industry benefited much from the 1930-31 tariffs without any increase in the cost of the produce to the public.

What remedies can we suggest for the many and accumulating ills from which the horticultural industry is now suffering? Briefly we may summarize them in the following recommendations:

1. On the outbreak of war in 1939 a Horticultural Advisory Council was set up by the Ministry of Agriculture to advise on matters of national importance. It was composed of scientists and representative members of all sections of the Horticultural Industry, under the chairmanship of DR. H. V. TAYLOR. It did much useful work and, at the last meeting before being dissolved by the present Minister, prepared the outline of a transitional policy to be pursued on the cessation of hostilities. Some comparable body should be set up at once to advise the Ministers of Agriculture and Food at the present critical time.
2. There should be far closer co-operation between the Ministries of Agriculture and Food. The vital need for readjusting the foundations of Government policy was stressed in two recent debates on horticulture in both Houses of Parliament, but no remedial action was taken.
3. The same relative measure of protection against the dumping of foreign produce should be given to the industry as before the war.
4. Every support should be given to development of co-ordinated collective organizations in all districts where there are many small growers. This would provide them with many facilities now only available to large growers and lead to greater uniformity in growing and packing.
5. A development commission should be set up composed of producers, distributors, and consumers to encourage the processing of home-grown fruit and vegetables. Such a body should be empowered to make mass contracts between small growers and factories.
6. Research and advisory work should be speeded up and increased educational facilities should be organized. In addition to other matters much research is needed about horticultural tools, appliances, and machinery.
7. Grading and packing materials similar to those available to continental growers should be supplied to British growers.

The time allotted has been too brief for touching on anything but the fringe of this vast subject. We have alluded to the importance of

the industry; its achievements under the stress of war; its future needs; the benefits it has received from modern science; its hopes and its fears, but we are always brought back to acknowledgment of four laws which have controlled husbandmen throughout the ages and will continue to do so. They are age-old and fundamental, and no man shall gainsay them:

Time—day and night.

Sweat and toil—seed time and harvest.

Change—summer and winter—cold and heat.

Faith—these things shall not cease.

CYCLAMEN PERSICUM

F. Streeter, V.M.H.

THE group of *Cyclamen persicum* exhibited at the Annual General Meeting was first started from three corms sent home to Petworth by LADY LECONFIELD from Cyprus during her visit there in 1925. They were quite small and shrivelled. They were put into small 3-inch pans containing four-fifths brick dust and one part loam and placed in a cold frame. No water was given until the first sign of growth was noticed, then they were shaken out and replanted into the following compost: 2 parts loam, 1 part flaky leaf-soil and 2 parts sand with a sprinkling of charcoal; their growth in a coldhouse was rapid and the markings on the foliage were all different. On November 1 the first flowers opened and they continued up till March. The smallest flowers were pollinated and about 20 pods set. They then gradually died down and the plants were placed in full sun on a shelf in a Nectarine house where the ventilators were seldom closed and the plants were kept absolutely dry, as the lights were lowered during rain; they were baked for about 12 weeks. In the meantime the seeds had ripened and were sown immediately; it takes a good long while for them to burst and it is best to place a sheet of kitchen paper under the pots so that no seed is lost, in case you are not quite quick enough to notice them. Sown in pots 2 inches apart in sandy soil they take about one month to germinate and during the first week in November they are ready for pricking out, about 48 in a seed-box. They grow very quickly. There was no heat as it was impossible to give them any owing to so many house plants being required and they had to be moved about wherever there was room in the fruit houses. They were then transferred to small pans from 3 to 5 inches in size; they seldom require anything larger for several years and then only when the corm becomes too large for the pans. The three originals are still here and in 6-inch pans and they carry up to 200 flowers at a time; we have counted over 300 and buds to come. (Figs. 89 and 90.)

They are charming little plants and very sweetly scented, in fact, when passing by a house of them in flower it is quite strong. It is one of the few strongly scented plants these days, even surpassing the

Freesias. By keeping and selecting the smallest flowers for seed producing, one keeps that lovely daintiness. We have crossed the large greenhouse types with them to try to get the scent. You get it all right, but cannot maintain it. It also does well planted out in sheltered places in the pleasure grounds, where the markings on the leaves are most pronounced,—and what a plant for the Alpine House!

After last season's very hot sun and the baking they got, I am sure this is the treatment they require. With all the other work, we could not possibly spare the time to water them, even if we wanted to, but they stand it. They form a lovely contrast to the others and do not suffer from damping buds and yellowing leaves and they are just the plant to stand indoors for a fortnight, then out in the cold house for another period, and thus you can use them again and again. They get no feeding and are never coddled and the corms go on year after year. The plants shown were all ages, from the three originals down to last year's seedlings and you get many shades of colouring. Pests do not trouble them, not even that beastly white maggot, which among their big brothers so often causes good plants to collapse. I do not know what the hybridist would do with them, but I certainly think their beauty lies in their easy production, daintiness and their scent. Just the type of plant for a very busy man who dislikes failures.

EUCALYPTUS IN THE BRITISH ISLES

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WHICH of the great number of species of Eucalyptus are likely to prove hardy enough in parts of the British Isles to be worth planting here? Perhaps I can contribute to the answering of that question; for, as a research worker in Tasmania and Australia, I have studied these plants in the wild, and I have lately had opportunities of enquiring into the results of some of the principal experiments in growing Eucalyptus which have been made in the British Isles during the past century.

One of the results of COOK's second voyage in 1774 was the introduction into Europe of *Eucalyptus obliqua*, by FURNEAUX of the "Adventure." Probably FURNEAUX found this species and *E. globulus* at Adventure Bay, Bruni Island, Tasmania.* By 1829, *E. globulus* was in cultivation in Europe. At Tresco Abbey in the Isles of Scilly *E. globulus* was introduced about 1838.

The oldest Eucalyptus I know of in the British Isles is the famous *E. whittinghamensis*, a form of *E. Gunnii*, which was raised from seed brought from Tasmania in 1846 by MR. JAMES M. BALFOUR of Whittinghame, E. Lothian. (Fig. 105.)

* See Aiton, *Hortus Kewensis*, 1789.

In the seventies and eighties of the nineteenth century there was a vogue for the planting of *E. globulus*, due partly to the fact of its extraordinarily rapid growth, partly to the erroneous belief that the tree and its extracts had anti-malarial properties. Great numbers were planted in the Mediterranean area, and the vogue spread to Britain. One planted as early as 1857 survives at Garron Tower in N. Ireland. Many other species, too, were tried by enterprising gardeners during the last quarter of the century, notably by the EARL OF ANNESLEY at Castlewella, Co. Down, by MR. ROBERT BIRKBECK at Kinloch Hourn, Inverness, by MR. EDWARD RASHLEIGH at Menabilly near Fowey; at about the turn of the century they were being planted by MR. WALPOLE at Mount Usher, Co. Wicklow, at Tresco Abbey in the Scillies, at Poole in LADY ROCKLEY'S garden, in COLONEL STEPHENSON CLARKE'S garden at Borde Hill, Sussex, and many other places.

Out of the twenty-four species that were started at Castlewella in 1876, the following survived in 1949:—*E. urnigera* (80 feet), *cordata* (60 feet), *Gunnii* (60 feet). *E. coccifera* had survived the frosts but had lately been blown down.

The experience of MR. BIRKBECK with his plantings at the head of the grim Kinloch Hourn was recorded over forty years ago in ELWES AND HENRY'S *Trees of Great Britain and Ireland* (p. 1019). I have not been able to examine the grounds thoroughly, but during a brief visit I noted *E. Johnstoni*, *coccifera*, *urnigera* and *Gunnii* flourishing in quantity.

At Menabilly, the once rich collection made by MR. RASHLEIGH has been so neglected that survivors are hard to examine in the jungle, but I noted *E. coccifera*, much broken by gales, and *E. gigantea*, cut by frost.

At Rostrevor, survivors include *E. coccifera*, *cordata*, *subcrenulata*, *urnigera*, *vermicosa*, *ovata*, and a remarkable plant provisionally called *E. biangularis*, probably a rare intermediate between *globulus* and *urnigera*.

At Mount Usher MR. E. H. WALPOLE has been remarkably successful with a number of species, especially *E. urnigera* and plants raised from Tasmanian seed in 1895 under the name *E. Muelleri*. *E. urnigera* has reached 120 feet, and was uninjured by frosts of 6° F.

Trees of the so-called *Muelleri*, 100–120 feet high, were cut but not permanently damaged by 6° F. Actually, this plant appears to be a form of *E. subcrenulata* (with some characters of *E. urnigera*). Other thriving species at Mount Usher include *E. gigantea*, 90 feet high, hardy to 6° F.; *pulverulenta*, cut by 6° F. but recovered; *viminalis*, over 120 feet, defoliated by severe frosts but not killed; *coccifera*, hardy, 20–80 feet; *virgata*, cut to the ground but not killed by 6° F.; *Stuartiana*, 120 feet, hardy to 6° F.; *Delegatensis*, 90 feet, hardy to 6° F.; *globulus*, hardy till the frosts of 1940–41. 22° F. sufficed to kill *E. ficifolia*, *Macarthurii*, *obliqua*, *polyanthemus* and *regnans*.

Having considered these and many other trials in different parts of the British Isles, I will attempt a rough classification according to hardiness. I must point out, however, that resistance to frost depends very much upon site and soil. Few Eucalyptus can stand a wet soil; and the notable successes at Mount Usher are probably due largely to a well-drained gravelly soil as well as to good cultivation and kindly climate.

Thus, after a century of experiment, it seems safe to make these two statements about the growing of Eucalyptus in the British Isles.

Firstly, there are a fair number of species which are of high decorative value and of sufficient hardiness to be worth planting in well-drained soils in some or many parts of the country.

Secondly, there is a good prospect that some Eucalyptus species or hybrids can be found or produced, which would find a useful place in the country's forestry. Few of the species cannot be crossed; the hybrids can, it seems, be stabilised quickly; and it should be possible to combine the qualities of frost resistance (such as that shown by trees at the tree-limit on Mount Kosciuszko) with the qualities required by the timber-cutter.

My grateful thanks are due to MR. W. ARNOLD-FORSTER for much assistance in the collection of information and for the preparation of the manuscript in a form suitable for this JOURNAL.

I would also like to record my thanks to all those who so freely supplied me with information about their trees.

LILIUM SHERRIFFIAE, A NEW HIMALAYAN LILY

William T. Stearn

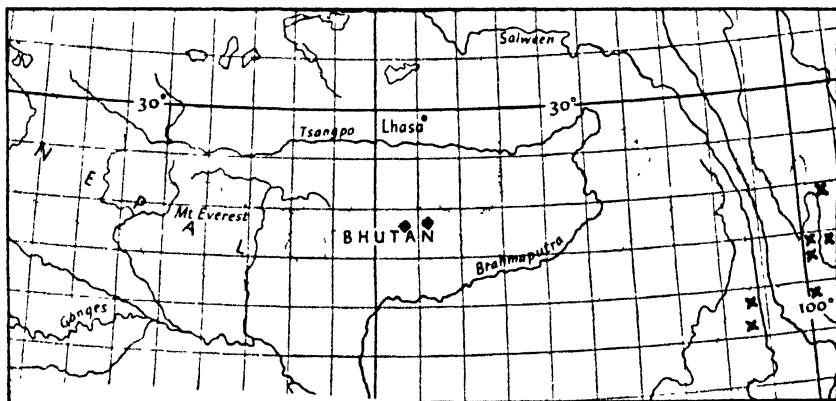
BHUTAN is a little-known Himalayan state which has long had an alluring reputation as forbidden territory. WILLIAM GRIFFITH collected plants there in 1837 and 1838, MR. ROLAND EDGAR COOPER in 1914 and 1915*, SIR BASIL GOULD from 1938 to 1944, but the greatest additions to our knowledge of its rich and varied flora have been made in recent years (1933, '34, '36, '38, '47 and '49) by MR. FRANK LUDLOW and MAJOR GEORGE SHERRIFF latterly assisted by MRS. SHERRIFF and DR. JOHN H. HICKS who accompanied them in 1949. Their big 1949 collection of herbarium specimens is now in course of identification at the British Museum (Natural History), London, S.W. 7. Seeds and bulbs gathered at the same time have been generously distributed to many gardens and should yield some interesting and beautiful new plants during the next few years. These include a remarkable undescribed species of *Lilium*.

A solitary plant of this Lily was found in bloom by MRS. SHERRIFF and DR. HICKS on May 31, 1949, near Lao. It grew in rather sandy soil among low willows on the bank of a stream at 9,000 feet (2,743 metres). The nearly 2 feet high stem, with sparse linear or linear-lanceolate foliage, carried a solitary flower which MRS. SHERRIFF remembers as being funnel-shaped and horizontally poised; her field-note describes its colour as "maroon with inside of corolla chequered with gold."

* COOPER, R. E. "Botanical tours in Bhutan" *Notes R. Bot. Gdn. Edinb.* 18. 66-118 (1933); "Notes upon Bhutan in the Eastern Himalaya" *J. R. Hort. Soc.* 74. 68-75 (1949).

† FISCHER, C. E. C. "New plants from Bhutan and Tibet" *Kew Bull.* 1939. 663-666; "Contributions towards a flora of Bhutan" *Kew Bull.* 1940. 158-160. Sir Basil's plants now in the Kew Herbarium were collected in Western Bhutan on the route Yatung-HaLa-Bumthang, and Ha via the Tremo La to Phari in Tibet.

This tessellation can be clearly seen in the dried specimen (L.S.H. 20655; Fig. 108). The related *Lilium Bakerianum* var. *Delavayi* (figured in *R. Hort. Soc. Lily Book Year* 13, Fig. 2: 1949) of Western China has a perianth variously mottled and spotted with dark reddish-purple on a dull greenish-yellow background, but the more regular patterning of MRS. SHERRIFF'S Lily is better compared with that of the Snake's Head Fritillary (*Fritillaria Meleagris*) and various Colchicums. The hazards of plant-collecting are illustrated by an accident which befell MRS. SHERRIFF not long after the discovery of the plant. She broke her arm through a fall among rocks and had all the discomforts of a six weeks' journey over rough mountain tracks and wild country back to Bengal. E. H. WILSON suffered a rather similar misfortune on the memorable 1910 expedition which achieved the introduction in quantity of *L. regale*, his leg being broken by a falling rock in the wilds of Western China.



Distribution of *Lilium Sherriffiae* (♦) in Bhutan and *L. Bakerianum* var. *Delavayi* (×) in Western China.

Plants evidently belonging to the same species as that of Lao were later found by LUDLOW and SHERRIFF at 12,000 feet (3,658 metres) by the Dhur Chu near Bumthang (the present-day capital of Bhutan) about 50 miles west of Lao and due south of Kulakangri. Here they occurred abundantly in a very small area and were known to the local inhabitants under the name "abēcās." The flowers of all but one had given place to immature capsules; this one flower was dark red-brown and not properly open. The plants grew either on an open grassy hillside or under trees on the banks of the river Dhur associated with species of *Fritillaria*, *Cotoneaster*, and *Polygonatum*. Weak specimens were about a foot high. Out of a hundred or so plants all, except one vigorous two-flowered individual 3 feet high, had borne only one flower each. In October 1949 LUDLOW and SHERRIFF returned to the place where they had found the plants in July and obtained a good supply of bulbs and seeds. The largest bulb measured $1\frac{1}{4}$ inches across but most bulbs were about $\frac{1}{2}$ -inch across. It is hoped that they will enable the species to be established in cultivation. Meanwhile it seems desirable to record the characters of the plant as revealed by the herbarium material.

Lilium Sherriffiae Stearn; species nova cum *L. Bakeriano* var. *Delavayi* (Franchet) Wilson comparanda sed caule glabro, foliis glabris, floribus vero tessellatis, segmentis interioribus, oblongo-ellipticis, antheris linearibus distincta.

Bulbus anguste ovoideus, ochroleucus, c. 2-5[-3] cm. altus, *squamis* paucis anguste ovatis acutis. *Caulis* erectus, uniflorus vel raro biflorus, glaber, [35-]58[-90] cm. altus, sparse foliatus, basi radicans. *Folia* sessilia, dissita, c. [8-]15, linearia vel lineari-lanceolata, 6-13 cm. longa, 5-9 mm. lata, glabra, acuminata, multinervia. *Flos* horizontalis, infundibuliformis (fide Mrs. Sherriff), brunneo-ruber eximie aureo-tessellatus instar *Fritillariae Melegridis*; *bractea* foliacea; *pedicellus* 2[-7] cm. longus. *Segmenta perianthii* ut videtur recta, oblongo-elliptica, c. 5.5 cm. longa, glabra, acuta, exteriora c. 1.8-2 cm. lata, interiora c. 2.3-2.5 cm. lata, *sulco nectarifero* brevi levi. *Filamenta* gracilia, c. 1.8 cm. longa, vix 1 mm. crassa, glabra, pallida; *antherae* lineares, post dehiscentiam c. 1.2 cm. longae, 1 mm. latae; *pollen* aurantiacum. *Ovarium* cylindricum, c. 1 cm. longum, 2.5 mm. diametro; *stylus* clavatus, c. 2.8 cm. longus, glaber; *stigma* leviter lobatum c. 3 mm. latum. [Measurements in square brackets are taken from specimens other than the type.]

Hab. EASTERN BHUTAN: Lao, Trashiyangsi Chu, approx. 91°28 E., 27°51 N., alt. 9,000 feet, 31. v. 1949, *Ludlow, Sherriff & Hicks* 20658 (Herb. Mus. Brit.; typus); Dhur Chu, Bumthang Chu, approx. 90°37 E., 27°44 N., 12,000 feet, 22. VII. 1949, *Ludlow, Sherriff & Hicks* 1949 (Herb. Mus. Brit.).

The co-operation of DR. GEORGE TAYLOR in making the above material promptly available for examination is gratefully acknowledged.

SOME SCENTED-LEAVED PLANTS

A. D. B. Wood

A LIKING for pleasant scents, and an appreciation of the aromatic fragrance of gums and leaves has probably existed from the time when primitive man discovered that beside giving warning, or conveying attraction, his sense of smell could provide him with deliberate pleasure. The use of these scented materials was certainly well established in the great civilizations of the ancient world. In the hanging gardens of Babylon there were fragrant trees; frankincense and other gums were used in Egypt; in Greece some of the priests chewed Bay leaves to inspire them to prophecy, and myrtle was mixed with their wines and love potions.

In England many aromatic plants are referred to in the herbals and elsewhere, generally for use in the kitchen or in medicine. The sprigs of Rue and Rosemary presented to the judge at the Old Bailey trace back to the days when they were intended to ward off gaol-fever, or as DR. HAMPTON (1) has suggested, the bugs and lice which carried the fever. Our imagination is touched by the economy of phrase in this passage from the herbarium of APULEIUS:—"If any propose a journey, then let him take to him in hand, this wort, *Artemisia*, then he will not feel much toil on his journey.' But the contemplation of these matters is brought to an unexpected level, when JOHN EVELYN describes as "one of the most agreeable of all the herbaceous dishes" . . . "violet leaves at the entrance of spring, fried brownish and eaten with orange or lemon juice and sugar."

The function of scent in flowers appears in most cases to be to attract



Photos, J. E. Downward

FIGS. 89, 90—*Cyclamen persicum*. A fine exhibit for which a Gold Medal was awarded to LORD LFCONFIELD at the Show on February 14, 1950. These plants were raised from three corms sent from Cyprus in 1925 (See p. 185)



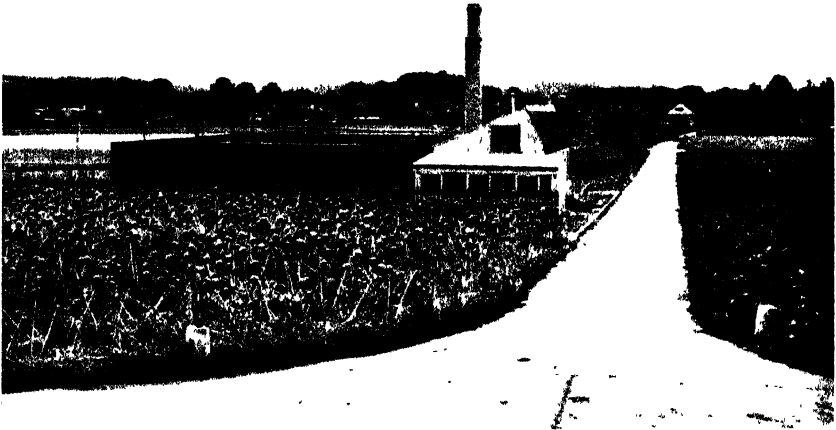


Photo Sport & General Press Agency Ltd

FIG. 91—General view of layout, wells, pumping shed and storage reservoir in foreground, of Mr F. A. SECRETT's horticultural holding at Milford, Surrey (See p. 177)



PRESENT-DAY PROBLEMS OF THE HORTICULTURAL INDUSTRY

FIG. 92—Mains supported on concrete dollies, fitted with valves 35 feet apart (See p. 177)



Photo, Fox Photos Ltd.

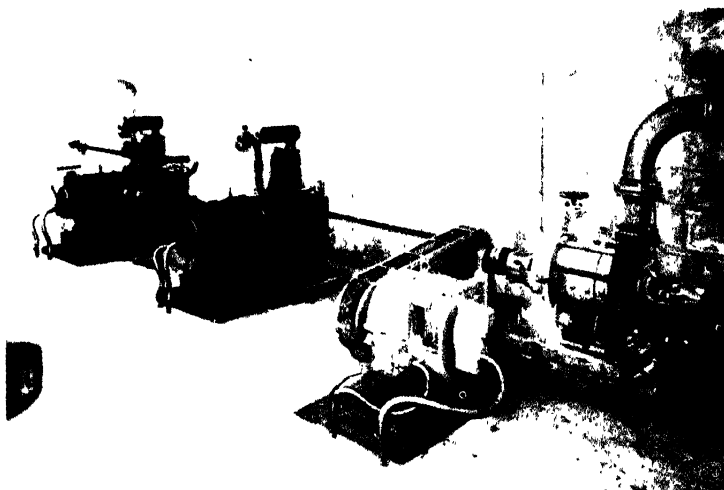
FIG. 93—Radishes being gathered in February. Early crops help to pay wages throughout the year and give the grower prestige (See p. 177)



Photos, Fox Photos Ltd.

PRESENT-DAY PROBLEMS OF THE HORTICULTURAL INDUSTRY

FIG. 94—Capital expenditure can be of no value unless hand labour is available in quantity for harvesting the produce (See p. 182)



Photo, Malby

FIG. 95 Interior of engine house, on left electric motors and compressors for air lift from the wells, on right motor and four-stage centrifugal pump for supplying and boosting the water to the mains (See p. 177)



Photo, Fox Photos Ltd.

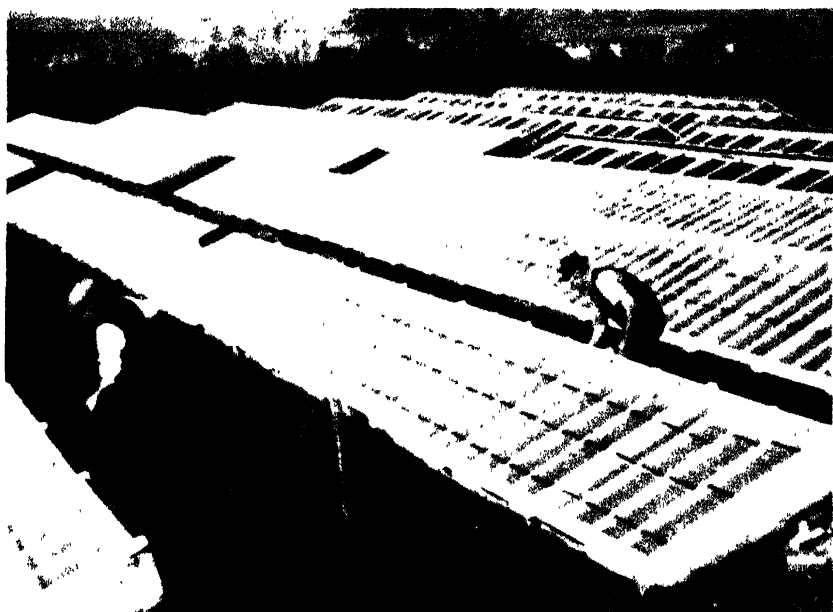
PRESENT-DAY PROBLEMS OF THE HORTICULTURAL INDUSTRY

FIG. 96 Work on Tomatoes in greenhouses which should be a part of an intensive holding (See p. 176)



Photo, Fox Photos Ltd.

FIG. 97 - Dutch lights layout (See p. 177)



Photo, Jack Minnitt

PRESENT-DAY PROBLEMS OF THE HORTICULTURAL INDUSTRY

FIG. 98— English lights as used in the past; in the background newer Dutch lights which admit more light (See p. 177)



Photos, Ma'hvy

PRESENT-DAY PROBLEMS OF THE HORTICULTURAL INDUSTRY--WASHING MACHINE

- FIG. 99 (top left)—Girl loading conveyor belt with bunches of Radishes
- FIG. 100 (bottom left)—Conveyor belt passes through bath in which water is agitated
- FIG. 101 (top right)—Conveyor belt than passes through spraying chamber Sprays are vertical and horizontal
- FIG. 102 (bottom right)—Vegetables are delivered direct on to a rubber belt and packed where two girls are engaged packing

This machine saves the work of 20 girls (See p. 176)



FIG. 103—Ploughing and subsoiling at Milford with teams of horses. One pair ploughing 11-12 inches deep, the pan following subsoiling a further 6 inches
(See p. 177)



Photos, Malby

PRESENT-DAY PROBLEMS OF THE HORTICULTURAL INDUSTRY

FIG. 104 -David Brown Tractor carrying out same operation to same depth as done by four horses (See p. 177)

FIG. 105—*Eucalyptus Gunnii*. Original tree at Whittinghame Castle; planted 1846 (See p. 186)



EUCALYPTUS
IN THE BRITISH ISLES

FIG. 106—*E. Johnstoni* at Kinlochhourn, Inverness (See p. 189)



Photo, B. O. Mulligan

FIG. 107---White-bark Pine (*Pinus albicaulis*) on left. Tree 45-50 feet tall, near Mt Stuart, Cascade Mountains, Washington. Altitude 5,500-6,000 feet. (See p. 197)

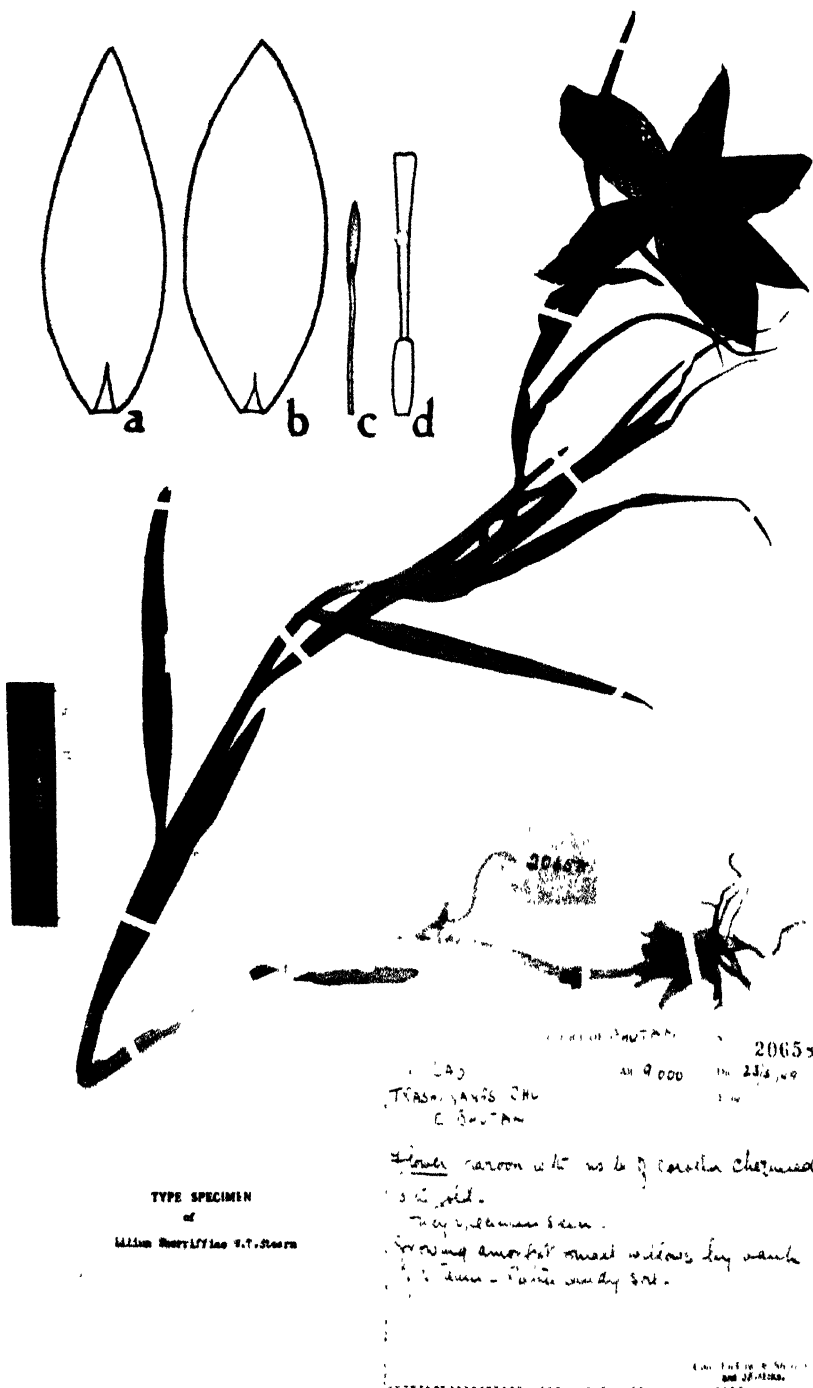


FIG. 108—Type-specimen of *Lilium Sherriffiae* Stearn in Herbarium of British Museum (Natural History): inset diagram, *a* outer perianth-segment, *b* inner perianth-segment, *c* stamen, *d* ovary and style (See p. 190)

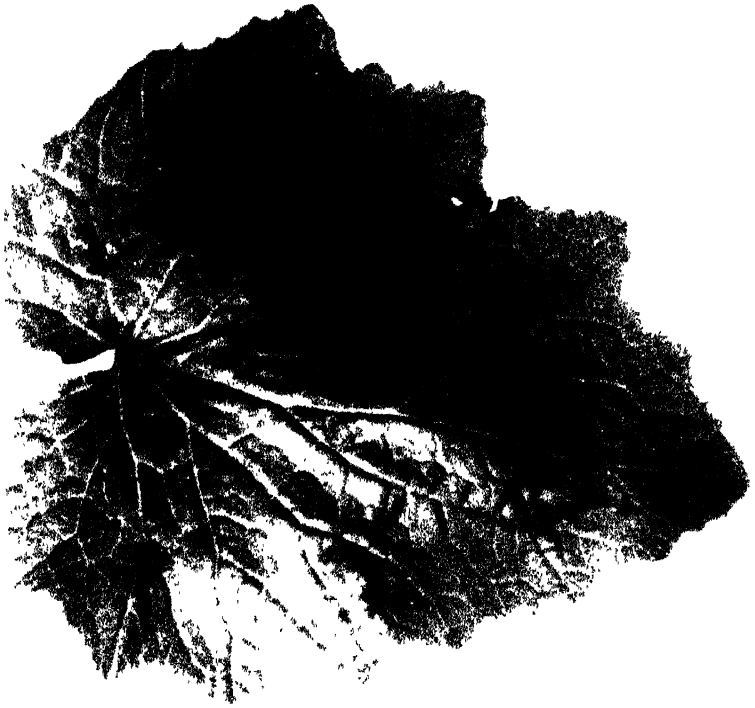


FIG. 109.—Leaf Spot Disease of Cineraria, *Alternaria senecioides* (See p. 199)



AWARD OF GARDEN MERIT

FIG. 110.—*Viburnum bitchiuense* (See p. 211)



photo, N. K. Gould

FIG. 111—*Anemone Pulsatilla*

WISLEY IN SPRING

FIG. 112—*Pieris japonica* in March



insects. In the case of leaves it is probable that those scents which DR. HAMPTON calls flower-like are intended also to attract insects when the flowers themselves are scentless—as in the Rose-leaf Geraniums. But it seems that the non-flower-like scents in leaves such as Rosemary and Bay are intended to act as deterrents to harmful insects and to browsing animals. There is also a theory that the aromatic vapour floating above the plants forms a protective atmosphere against the rays of the sun, and certainly many of the aromatic plants are to be found growing wild in hot dry situations, notably in the Mediterranean region—which in turn may explain why such plants as Myrtle, some of the Lavenders and Cistuses, Rosemary, Bay and some of the Sages are not entirely hardy in this country.

Of those aromatic plants usually grown outdoors in the garden, the one that comes first to mind is the favourite Lemon Verbena, *Lippia* (*Aloysia*) *Citriodora*, a native of Chile, and first brought to this country in 1784. Like many other scented-leaved plants it is markedly tender, and in the South of England requires the protection of a wall, and even then may be cut in hard winters. In my garden in Berkshire there is a plant which at three years old has reached a height of seven feet, and has a woody stem nearly two inches in diameter. In the autumn of 1948, wishing to protect it for the winter, I had it enclosed by hessian, stretched round tall stakes. In an excess of anxiety (for the winter proved to be one of the mildest recorded), I had certain other plants on the same wall covered in a similar way. Depending on the size and span of the plants these winter wrappings took on strange appearances, some aloof and monolithic, others squat and lowering, so that in the half light of winter evenings, they looked like a row of watchers, standing silent. and a little sinister, against the house; There was also the occasional pleasure of taking a visitor through the garden door at dusk walking him down to the bottom of the garden, and turning round to indicate "my Henry Moores."

By thus enclosing my *Lippia* I acquired an unexpected harvest. The plant is deciduous, and mine being totally enclosed dropped all its leaves inside the hessian covering, so that a large bowlful was readily gathered, when the covers were taken off in the spring. The dead leaves seemed as strongly scented as when they had been alive, and only needed gentle agitation in the bowl to release the scent.

In spite of its tenderness, the Lemon Verbena is well worth growing, since if a casualty should occur in the winter, it can be replaced by a young plant from a pot, which will grow rapidly in its first season after being first put out against a warm wall. The plant strikes easily from cuttings in spring, and it is convenient to keep a sequence of young plants in pots in the cold green house, partly for their own sake, but also to replace any that may be killed outside.

The scent is not released without pinching the leaf, an action which breaks certain specialised cells containing the complicated volatile substances, collectively and loosely known as essential oils. DR. HAMPTON states that the substance giving the lemon scent is citral, and that in the lemon-scented Verbena, this citral is not the only element present, but is superimposed on a background of other perfumes.

In Lemon Verbena, and to some degree in some other plants, the lemon-scent as it were takes the solo part in a concerto, but it may also be present as a member of the olfactory orchestra, when some other element of perfume is taking the solo part, as for instance when geraniol picks up its bow to play the celebrated Rose Geranium Concerto.

Citral is present in lemon-scented Thyme, *Thymus citriodorus*, which with its brothers and sisters seem now to be less grown in gardens than they might be. Thymes are good to plant at the extreme front edge of a border and to encourage to creep over the band of stone paving which every border should have between it and the grass or gravel. Here they will grow happily in the sun, drawing the bees, and ready to be picked and pinched to give up their fragrance, one of the cleanest and most refreshing of all scents, and much used in the making of scented soaps. There is another creeper useful to encourage over the stone band at the front of the herbaceous border, *Artemisia pedemontana*, with grey foliage and a sharp teasing aromatic smell. *Artemisia abrotanum*, with its poignantly antithetic names of 'Old Man' and 'Lad's Love,' has a rough aromatic scent, and fine foliage which makes it worth including in a herbaceous border where, if it becomes too large, it can be cut down almost to the ground in the spring. Many of the Artemisias have grey foliage, some of very fine texture, notably the variety *Stellariana*, whose feathery greyness recurring in penetrating drifts down the border can point the rhythm with unerring precision.

Bergamot, once used mainly as a herb for the flavour of its leaves, can with advantage be planted in the herbaceous border. To my mind the best of the many slightly different Monardas which have recently made their appearance is 'Crottway Pink,' which when planted in drifts associates well with *Artemisia* and *Salvia virgata*.

There are many scented leaved plants in the large family of the Sages. One which is now used in herbaceous borders for its handsome flowers and bracts is a variety of the Old Clary, *S. sclarea* var. *turkestanica*, whose leaves have an unmistakable and pervading smell, which is never admired, but about which there is disagreement as to whether it is interesting or definitely unpleasant; it is a little reminiscent of Black Currants with, I think, a dash of the foxy smell of Crown Imperial, though MR. FOTHERGILL, in his *Innkeeper's Diary*, has another name for it. The leaves of Clary, when distilled, give off a muscat scent, which is an ingredient of perfumes, and has also been used to flavour some German wines.

Salvias, in whose leaves the characteristic smell of Sage is mixed with that of Black Currant leaves, are *Salvia Grahami* and its near relation *S. Greggii*. I have a dozen or so plants of *S. Grahami* on the south wall of the house under the dining-room window, where in the latter part of the summer they are sought out by humming-birds hawk moths. These plants are seldom without flowers from June until the frosts begin, and to me, one of their special virtues is the delicate balance which is maintained between flower and leaf. The amount of carmine-red bloom is very nicely proportioned in the bright apple-green foliage. These Sages grow to a height of about three feet; being natives of Mexico they are not strictly hardy here, though it is likely that they would survive a mild winter when grown against a south wall. Winter casualties need not in

any event be regarded very gravely, since the plant strikes readily from cuttings, and grows rapidly, reaching a height of from two to three feet in one summer, so that it can if necessary be treated as summer bedding.

The herb grown in kitchen gardens is the Common Sage, *S. officinalis*, but there is a lesser known and charming cousin, *S. lavandulifolia*, with a dwarfer almost prostrate habit, and bright sky-blue flowers of much beauty in the summer. The leaves are more pointed than those of the common herb, and when pinched, have a strong fragrance of Lavender overlaying the smell of Sage.

*S. coerulea** is a new plant to me, and experience of it is limited to rather less than a whole year. It is grown in a cool greenhouse where it seems to reach a height of about 3 feet. Its leaves have a smell of Sage, but its glory is in its deep blue flowers, which like those of *S. Grahami* are spaced with great elegance against the foliage. Another *Salvia* is *S. rutilans*, with pretty scarlet flowers and vivid green leaves which when pressed smell clearly and strongly of Pineapple.

If I had to make a list of scented-leaved plants known to me, and common in our gardens or greenhouses, I would place *Origanum microphyllum* second only to Lemon Verbena. This plant, sometimes known as Citronella, is a native of Crete, and not generally hardy in this country. The scent of the leaves has a great deal of Lemon about it, but it is sweeter, less clear cut and refreshing than Lemon Verbena. In the summer it can be put out into borders against the house, where rain or the use of the hose will sufficiently agitate the leaves to send the charming fragrance floating upwards through the windows. It strikes fairly easily from cuttings, and it is best to renew stocks each year, because as it gets older it tends to develop an ungainly habit.

There are two small Lavenders which are more tender than the common *Lavandula Spica*, and need the protection of a greenhouse: *L. dentata*, from the Mediterranean region, has pale lavender-coloured flowers, largely hidden by conspicuous bracts of a darker shade. The leaves are much toothed, of a dull green colour, and have a pleasantly bracing tang which sharpens the usual Lavender scent. Plants in the greenhouse grow to about one and a half to two feet in height; they can easily be propagated from cuttings. *L. multifida*, native of the Canary Islands, is a smaller plant, with lilac flowers and pale green downy leaves, with, again, a slightly astringent version of the Lavender scent.

Favourites of our grandmothers, but sadly neglected to-day, the scented leaved Pelargoniums are some of the easier and most rewarding plants to grow in a cool greenhouse. The ones that I grow are known to me by the names used here, but there has been confusion in nomenclature since ROBERT SWEET, in beginning his great book *Geraniaceae* in 1882, treated some garden hybrids as species, for instance he states that *Pelargonium Scarboroviae*, the COUNTESS OF SCARBOROUGH'S 'Storks-Bill' was raised from seeds in the collection of that lady, and goes on to say that it appears to be intermediate between *P. obtusilobum* and one of the Citron-scented kinds, noting that it had a pleasant Lemon scent.

*EDITOR'S NOTE—This is the plant to which an Award of Garden Merit was given in 1949. It is described on p. 210 of this part under the name *Salvia ambigens*. It is grown at Wisley as hardy plant.

There are at least two of the scented-leaved Pelargoniums which, besides being fragrant and ornamental in the greenhouse, can be put out with good effect in the summer. The first is *P. fragrans* which SWEET calls the Nutmeg-scented 'Storks-Bill' and notes that WILLDENOW describes it as a species, and native of the Cape of Good Hope, though himself considering it more probably a hybrid of *P. odoratissimum* fertilized with the pollen of *P. exstipulatum*. It is sometimes known as *Geranium odoratissimum*, and has small whitish flowers with varying degrees of red or pinkish veining, the leaves are obtuse-cordate, faintly grey-green, carried daintily, with a fragrance in part reminiscent of Nutmeg, but with a background of other aromatic scents in which lemon and peppermint are discernible, and also something, possibly eucalyptol, from DR. HAMPTON'S camphoraceous group. This neat compact little plant looks very well in groups of three or five planted out in the summer to fill vacant spaces in the front of the herbaceous border.

The other plant for which I find good use outdoors in summer is one of the Oak-leaved Pelargoniums: *P. quercifolium major*; its scent is near that of the Rose Geraniums *P. capitata*, and *P. radula*. The main constituent is geraniol, with citral plainly discernible and also, to me, a suggestion of pinene, which it may be noted, is present in the glandular hairs of the Moss-Rose as well as in Pine needles. Small plants out of pots look well in front of my row of *Salvia Grahamei* which, as they get older and survive successive winters, tend to develop bare legs and require something in front of them. Another use I have found for it outdoors is in the spring border. This is permanently planted with spring flowering shrubs, space being left for Daffodils in front, and in deep enclaves between groups of shrubs. In years when the Daffodils are not to be lifted, the Pelargoniums can be put out among them in late May or early June, and so disposed as to hide the dying Narcissus foliage. When the Daffodil bulbs are to be lifted in July, the Pelargoniums must be kept in their pots until the lifting is over, and will still make good growth and provide a fine effect before the autumn. *P. quercifolium major* is a vigorous grower and may reach two or three feet in a summer. Its finely cut foliage is exceedingly handsome, covering the bare ground, and introducing texture and contour into the monotony which in summer must of necessity overtake a spring border.

The other Pelargoniums to be referred to are kept in the greenhouse all the year. The curled-leaved 'Storks-Bill' *P. crispum* which SWEET describes as "leaves lemon scented or inclining to a scent of the balm . . . an old inhabitant of our greenhouses having been introduced from the Cape ever since the year 1774 . . . always forming a snug bushy plant." It grows tall and thin, fastigiate, like a tiny Cypress. It has a distinguished and less easily propagated cousin in 'Lady Plymouth' (*P. crispum variegatum*) gold and silver variegated with a similar fragrance in the leaves. Both these plants should I feel be capable of being put out in the summer with great effect, but I have not so far found a situation or surroundings to set them off to advantage.

The Southerwood-leaved 'Storks-Bill,' *P. abrotanifolium*, has delicate finely cut foliage with a strong scent like sweetened Southernwood. *P. graveolens* described by BAILEY (2) as having a rather heavy balsamic odour, smells to me chiefly of varnish.

'Attar of Roses,' and 'Godfrey's Pride,' are two of the Rose-leaf Geraniums with a preponderance of geraniol in their fragrance.

Two very distinct scents are encountered in *P. tomentosum* which is strong Peppermint, and *P. 'Shrubland Pet'* with its appetizing aroma of Parsley.

Scent is said to be apprehended in a primitive part of the human brain. Certainly a precise comparative analysis of it is unlikely ever to be formulated, and it is probable that its appreciation will always be subject to strong personal idiosyncrasy. I, for instance, have so far been unable to detect fragrance in Box leaves, and it is with admiration, therefore, that I read SIR GEORGE SITWELL (3) '... to find a proper epithet for the odour of the Box leaf, we should have to combine the adjectives warm, sweet, bitter, clean, aromatic'; and OLIVER WENDELL HOLMES on the Box bush 'which breathes ... the fragrance of eternity, ... for this is one of the odours which carry us out of time into the abysses of the unbeginning past.'

REFERENCES

- (1) HAMPTON, F. A., *Flower Scent*, Dulau.
- (2) BAILEY, L. H., *Standard Cyclopædia of Horticulture*, Macmillan.
- (3) SITWELL, SIR GEORGE, *On the Making of Gardens*, Dropmore Press.

NOTES FROM FELLOWS

The White-bark Pine

ON one mountain excursion last July into the central Washington Cascade Mts. we were able to see excellent examples of this species, *Pinus albicaulis*, at various levels between approximately 5,500 and 7,500 feet altitude.

While traversing a steep north-easterly snow slope on our way down to an inner valley between Ingall's Peak (7,600 ft.) and Mt. Stuart (9,470 ft.) we passed one magnificent old specimen (Fig. 107) standing beside a characteristic group of alpine fir (*Abies lasiocarpa*) on one of the "islands" then beginning to emerge from the snowfield, which in 1949 was much deeper and consequently remained longer than normally. This tree, or trees, had three distinct trunks twisted together, almost clear of branches for more than one-third of its total height, estimated at 45-50 feet. It was a most conspicuous specimen on this side of the valley, where the *Abies* and a flourishing colony of *Larix Lyallii* were predominant. On the opposite side, facing west or nearly so, many more pines were to be subsequently seen. At a point on the mountain-side around 6,500 feet the tree form changed to the shrub, and at the highest level reached by the pines, they were no more than tough, weatherbeaten bushes three or four feet high, eking out a lean existence on this steep and rocky slope in summer, covered by snow for probably eight or nine months of the year. Few woody plants go much higher than this pine, or above the 7,000 feet line, so far as we observed; *Potentilla fruticosa* and *Juniperus communis* var. *montana* are two that do so to some extent.

The ovoid, purple-brown cone is one of the most distinct amongst pines—hard, heavy, with thickened, blunt scales which never open in the normal fashion; the seeds are frequently extracted by squirrels or perhaps other animals or birds, and of this habit we found plenty of evidence, though we saw none of the depredators at work. The wing of the seeds also remains attached to the cone scale when the cone finally disintegrates.

This indehiscent cone and wingless seed, combined with leaves in clusters of five, places it in close relationship with the Swiss Stone Pine (*P. Cembra*) and *P. pumila* from N.E. Asia, but like the latter *P. albi-caulis* appears to be exceedingly rare in gardens in Britain; Borde Hill and Dawyck were the only records in the R.H.S. Conifer Conference Report of 1932, though both species occur in the Kew "Hand-List of Coniferae" in 1938. Since it is nearly a century since JOHN JEFFREY discovered it in British Columbia in September 1851, this is good evidence of its intractability under cultivation. It is a mountain plant and no doubt has little liking for the easy life at low levels. Perhaps a site on one of the bleaker Welsh or Scottish mountains would be more to its taste, but the slowness of its growth would make this a long experiment.

In nature it has a wide distribution, from Mt. Whitney in eastern central California northwards up the Sierra Nevada and Cascade ranges in Oregon and Washington into British Columbia, thence into Alberta and southwards on the Rocky Mountains through N. Idaho, W. Montana and the N.W. corner of Wyoming; it is not found in the Olympic Mts. of Washington.

One of the most detailed descriptions of this tree and its habitat, together with a figure of a cone-bearing branch, will be found in G. B. SUDWORTH's *Forest Trees of the Pacific Slope*, published in 1908 by the U.S. Department of Agriculture. Another photograph of a fruiting branch appeared in the Winter issue of the University of Washington *Arboretum Bulletin*, 1949.

BRIAN O. MULLIGAN

Meconopsis × *Sheldonii*

I read with great interest the note in the December number of the R.H.S. JOURNAL on *Meconopsis* × *Sheldonii*.

Perhaps it may be of interest also to some members to know that a natural hybrid between, what I call the 'Sikkim' (true blue) *Meconopsis grandis* and *M. betonicifolia* occurred in my garden in 1938. This is still alive and has formed a fine clump, so I think I can claim it to be a true perennial. There is no hint of purple or claret colour in the flowers of my plant, and I do not think I can agree with LORD ABERCONWAY that the flowering crown dies, as I have carefully watched and each year the new growth appears to come from the same crowns.

The colour of the flowers is a very clear brilliant blue and the plant itself reaches up to about 5 feet.

CICELY M. CREWDSON

A LEAF SPOT DISEASE OF CINERARIA (SENECIO CRUENTUS) NEW TO GREAT BRITAIN

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R.H.S. LABORATORY, WISLEY

At the Wisley Laboratory in November 1949 Cineraria leaves showing rather severe leaf spotting were received for examination and advice. The first specimens sent were from Tonbridge, Kent, and a few days afterwards further specimens with the same request were received from the Broadstairs area also in Kent. Within a day or two the increase in size of the spots showed that the disease, if any, was likely to be fairly destructive, and that the trouble merited special attention and further investigation. Accordingly, as soon as the infectious nature of the trouble had been proved by preliminary tests in the greenhouse at Wisley, a warning to growers in the form of a brief note was published in the *Gardeners' Chronicle* (1). The present account gives some further details which have since been elucidated concerning this disease.

The Symptoms. The spots in the earliest stages are very small, being almost pin-point size brownish-black specks on the leaf. They increase in size and in about ten days show as brown or blackish-brown irregular areas from $\frac{1}{4}$ inch to $\frac{1}{2}$ inch across (Fig. 109). As they get older, the central portion may turn a lighter brown with the outer zone much darker. The increase in size is fairly rapid, the spots appearing more water-soaked, the margins becoming less distinct and coalescence of the spots causing large areas of the leaves to be affected. Badly affected leaves are killed, and often spots may appear on the petioles causing the same kind of brownish rot. On the under surface of the leaf below the spots the veins become affected with a reddish brown rot and this, when the leaf is held up to the light, can clearly be seen running along the veins. Badly affected leaves gradually wither away and if infected in the stem may fall over at that point.

The Parasite. Microscopic examination of the spots revealed the presence of a fungus which was producing quantities of spores and obviously was a species of *Alternaria*. Young leaf spots were therefore cut out and plated and the fungus was brought into pure culture. When grown on a medium of prune agar (pH 6.0) and incubated at 21° C. it grew well, the mycelium being at first fluffy and light-coloured but quickly (in two or three days) assuming an olive-green colour. Both in slant and petri-dish cultures it was very slow in producing spores, but sporangia were hastened and this can be recognized by an even darker coloration of the mycelium. The spores are borne on simple, unbranched conidiophores (Fig. A). They are formed in short chains and are roughly conical in shape with both transverse and longitudinal septa, swollen at one end and at the other usually tapering to a short beak. They are smooth and coloured slightly olive-buff to dark brown. They have 2-10 transverse septa and 0-8 longitudinal septa. In size they vary

considerably, being from 77μ to 155μ long averaging $125\cdot5\mu$, and $15\cdot5\mu$ to $46\cdot5\mu$ wide averaging $23\cdot3\mu$ (100 measured). The spores are very

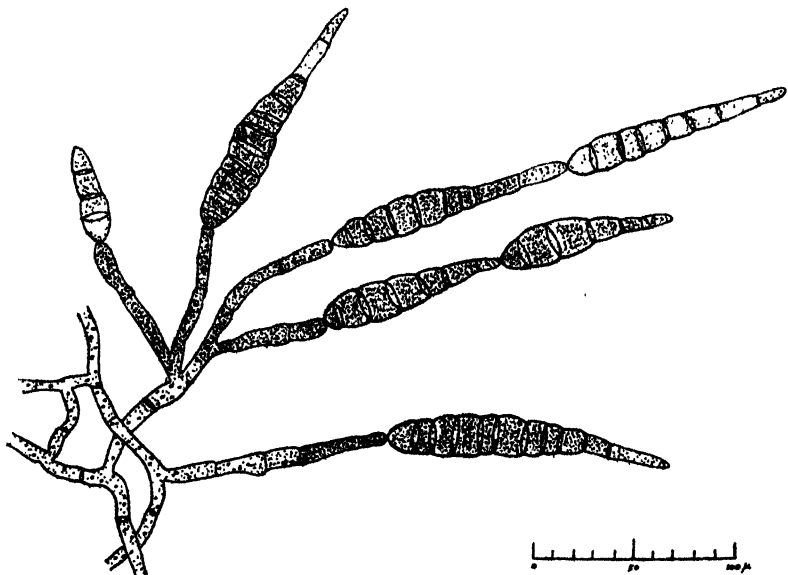


FIG. A—Spores of *Alternaria senecionis*. Camera lucida drawing

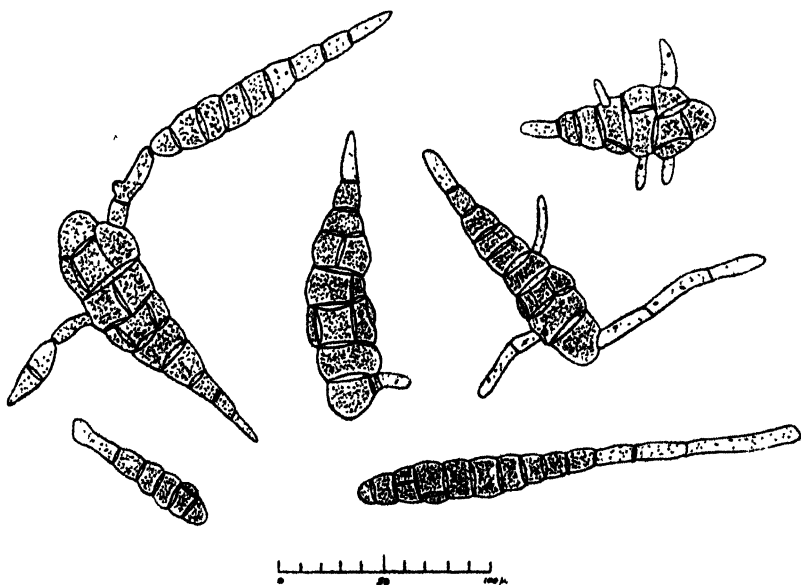


FIG. B—*Alternaria senecionis*; germinating spores. Camera lucida drawing.

quick to germinate but often the germ tubes, no matter from which cells they originate, give rise immediately to another spore similar to the parent (Fig. B). This we think occurs if conditions are slightly adverse. From the above data it was concluded that the fungus is the one known as

Alternaria senecionis, named by NEERGAARD (2), and although our spore measurements are slightly larger than those recorded by NEERGAARD (40.5 to 144μ long and 13.5 to 42μ wide) we believe it to be the same fungus.

History of the Fungus. *Alternaria senecionis* was recorded by NEERGAARD (3) in Denmark as causing a severe leaf spot of flowering plants of Cineraria and also a "damping off" disease of Cineraria seedlings. It was first noticed by him in the summer of 1943 and again in 1944, on seedlings in July and on large plants in December. NEERGAARD has also found the fungus present on the seeds and considers it of economic importance, especially in view of the fact that the disease can be seed-borne. Its appearance in this country is probably due to the importation of some seeds from the Continent although most of the Cineraria seed used by British growers is home grown.

Infection Experiments. Spores of the fungus in suspension in water were placed on the leaves of young, healthy Cineraria plants growing under normal conditions in the greenhouse at a temperature of $45-50^{\circ}$ F. The spores were scattered on the leaves, in some cases on the upper and in others on the lower surfaces, and also on certain leaf stalks without any wounding whatever. The only departure from normal cultivation was that the plants were covered with a bell-jar for thirty-six hours after treatment. Infection was rapid, for small spots could be seen on the leaves in three days and these increased in size to such an extent that within a fortnight the leaves were obviously badly diseased. There was no difficulty in recovering the typical *Alternaria* spores from these spots and furthermore, leaves on the same plants which had not been treated developed the same spots by natural infection, which obviously had not needed the aid of the bell-jar to increase the humidity. A point mentioned by NEERGAARD (2), and easily seen, is that in the under-surface of affected leaves immediately below the spots a reddish-brown discoloration running along the veins extends beyond the area of the spots. This is best seen when the leaf is viewed against the light and is a useful symptom.

In the course of these infection tests, it was noticed that on the foliage of some plants there was some variation in the rate of growth of the leaf spots, and that whereas in some cases the growth of the spots and the consequent deterioration of the leaves was rapid, in others the spots, although they appeared quickly, showed much slower growth and the leaves, although marked, were not so quickly spoiled. It would seem that there is a difference in susceptibility between individual plants but we believe there is little likelihood of resistant varieties.

Discussion. The preliminary note (1) on the appearance of this disease in Great Britain was published because it was felt that possibly it could become a serious trouble to growers of Cinerarias. It is certainly capable of infecting the leaves and of spreading under ordinary conditions at 45° F., although it would probably be most severe if the humidity in the glasshouse was rather high. In addition there is also the question of seed transmission which would help to distribute the disease, although up to the present the trouble is not widespread and Cineraria seed is mostly home grown. According to NEERGAARD contaminated seed may

give rise to "damping off" among the seedlings but in the cases brought to our notice no seedling damping off was noticed and the disease did not show until the plants were in the larger pots. In any case it is desirable that anyone concerned in the growing of *Cineraria* seed in this country should watch for any leaf spots and keep the plants clean by suitable treatment.

Control. At Wisley under the glasshouse conditions already mentioned we have found that spraying with a colloidal copper spray and a spreader did not harm the plants and a good cover was easily obtained. It is recommended that where this disease is suspected the first affected leaves be removed and burnt and the plants sprayed thoroughly with a spray of colloidal copper plus a spreader, taking care to spray the under as well as the upper surfaces of the leaves. To our knowledge this disease has been a nuisance in four areas in Kent and one in Eire.

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SOME CHILEAN PLANTS CULTIVATED IN BRITAIN

G. W. Robinson

PART II

THERE is a whole range of spiny members of the Rhamnaceae, though few of them are in cultivation in Britain. The three genera *Colletia*, *Discaria* and *Trevoa* are so much alike, and have been so mixed taxonomically, that it is by no means easy to determine them. All are curious and interesting spiny shrubs, with small white or rosy flowers. *Colletia* is undoubtedly the best known of the three, and *C. armata* and *C. infausta* are fairly common in collections. *C. armata* reaches 10 or 12 feet high as a bush and considerably more on walls. It is just a mass of hard terete spines with practically no foliage. Its small waxy white flowers are fragrant and are produced in autumn. It was introduced by VEITCH's from the Southern Provinces, though it is recorded as far north as Santiago. *C. infausta* was grown under the names of *C. horrida* and *C. spinosa* and was correctly determined by MR. N. E. BROWN in *Gardener's Chronicle* September 1916. It is very similar in habit to *C. armata* but is spring flowering; the white flowers are tinted with red or purple as is well shown in *Bot. Mag.* t. 3644 and *Bot. Reg.* t. 1776. *Colletia hystrix* is a small, very spiny and xerophytic shrub common in the Central Provinces especially on the sand dunes. An excavation exposed an enormous tap root like a small tree trunk, and out of all proportion to the size of the shrub.

Discaria serratifolia is a closely allied plant which is usually grown in Botanic Gardens. It has long slender spines rather more spaced out than in *Colletia* and its fragrant white flowers are borne in profusion. MR. BEAN gives the date of introduction to Kew as 1853. It was one of the plants collected by CUMING about 1830, though his seed may have failed to germinate. *D. discolor* is one of MR. COMBER's introductions which is described by BEAN in Vol. 3 of his *Trees and Shrubs* but I have neither grown nor seen it. *Trevoa trinervis* is a dwarf spiny shrub which also has fragrance to recommend it. It is extremely common in the Central Provinces. I introduced it in 1926 but it did not prove hardy.

The Pea family is represented by both shrubby and herbaceous plants. Cassia species are amongst the finest shrubs. Two species in particular are very common in the valleys of Central Chile, one preferring the hot and dry slopes the other part shade deep in the valleys. The latter, *Cassia stipulacea*, has taken kindly to cultivation at least under glass, and has flowered freely both at Wisley and at Kew. It has rather small flowers for the genus but they are borne profusely and are of an attractive orange shade. Both were collected in 1926 and sent to Kew and other gardens. I could, however, scarcely claim them as new, as SWEET's *Hortus Britannicus* gives the date of introduction as 1786. The other species, *C. Closiana* was, I believe, a failure, as it declined to flower. It is, however, a beautiful plant in its native country and would probably be as successful in the Riviera or S. Africa. *Psoralia glandulosa* is a bush of erect habit some 10 or 12 feet high. Flowering in autumn it has racemes of small blue pea-like flowers. It is known to every Chilean child, as the young shoots are used as an infusion and cooling drink. There was for many years a fine plant outside the Mexican house at Kew but it is not often seen in cultivation. It was amongst the earliest Chilean introductions and is mentioned so early as 1770, and figured in the *Bot. Mag.* t. 990 in 1806.

Deciduous shrubs are not frequent in Chile, but one of them, *Acacia Cavenia*, is in certain districts the dominant species. In habit it is close growing and the branches are heavily armed with spines which have earned it the vernacular name "Espino." Its golden yellow flowers are attractive and are freely produced in September and October.

Sophora tetraptera is found so far north as Valparaiso but usually in a stunted and dwarf condition, having become an extremely drought-resistant slow growing shrub some 3 feet high and spreading by subterranean stolons to make large clumps.

Lathyrus pubescens is a lovely climber for a warm sunny situation but is neither reliably hardy nor a long lived plant. Its flowers are lavender in colour, pleasantly scented and produced over a long season. Seed is usually freely produced and it is worth while raising a few annually. It is an excellent cool-house plant where conditions are not sufficiently congenial for outdoor cultivation (*Bot. Mag.* t. 3996). MR. COMBER found and introduced a lovely white form which I hope is still in cultivation. He also introduced *L. magellanicus*, which received the Award of Merit of the R.H.S. in 1929, from his seed. It produces racemes of purple flowers, the keel being paler in colour. It is probable that all the early figures and records under this name refer to the allied *L. nervosus*

'Lord Anson's Pea' which is a plant of the East coast (Argentina) and much less hardy.

Lupinus microcarpus is one of the commonest annuals in some parts of Chile. It is only a foot or so high and lavender in colour. It has proved a difficult plant as it damps off in wet weather in Britain, it has in fact been introduced and lost several times (*Bot. Mag.* t. 2413, 1823).

Chilean Rosaceae are best known by the Geums which are in fact the parents of most of our garden varieties. *G. chilense* I still have, though it is not often seen outside Botanic Gardens. It is brilliant and free flowering. It has of course long been superseded in popular esteem by its double forms particularly the old favourite 'Mrs. J. Bradshaw' a plant which received its Award of Merit over 40 years ago. The species has been listed and grown as *G. coccineum* and has been figured several times under this name. *G. Quellyon* is a form of it which is given specific rank by some authorities. The closely allied *G. magellanicum* with yellow flowers also has been eclipsed by the numerous garden varieties mainly derived from it.

Acaena is of interest as one of the Genera found in both S. America and New Zealand, the species being closely allied and similar in habit and appearance. At least half a dozen Chilean species have been in cultivation, being used chiefly for crazy paving work and carpeting under bulbs. The best known is *A. argentea* a useful prostrate-growing plant with conspicuous spherical fruits. These plants are very unpopular in their native habitats as the fruits become matted in the wool of sheep and other animals. They have sharp thorns and often inflict great pain on dogs by getting between their toes.

An entirely different type of fruit is produced by the allied 'Pearl-berry' *Margyricarpus setosus*. It is a dwarf shrubby heath-like perennial which revels in hot dry situations. It is in fact as drought resisting as a cactus, and is common on the coastal sand dunes where the sand gets so hot that one cannot sit on it.

Fragaria chilensis is of course one of the parents of our garden race of strawberries, it is still in cultivation in Botanic Gardens. Native of the Chonos Archipelago, Valdivia and Juan Fernandez, it was introduced to Europe by a French officer named FREZIER.

The Saxifrage family is best represented by Escallonia of which a number are Chilean, though they are unfortunately not hardy everywhere. The hardiest is *E. Phillipiana*, a deciduous species. It has white flowers more open than is usual in the genus. A native of Valdivia it was introduced by PEARCE for VEITCH's and named in honour of one of the most notable Chilean botanists, PROF. R. A. PHILLIPI. The best known is probably *E. macrantha* which is so frequently used as a wall shrub, though in the West it is extensively planted in the open and makes immense bushes, it is frequently used as a hedge plant. The bright red flowers are decorative and the evergreen foliage always cheerful. It was one of LOBB's introductions from Chiloe about 1846, and has been figured in the *Bot. Mag.* t. 4473. The well-known hybrid between these two species, *E. Langleyensis*, is still one of the most free flowering and decorative varieties. Other red flowering species are *E. rubra* an old garden plant, *E. punctata* and *E. Fonkii*. *E. punctata* is regarded as the

hardest of the evergreen group. It was introduced in 1827 and is figured in *Bot. Mag.* t. 2890. *E. Fonkii* was introduced by MR. COMBER so recently as 1926. *E. viscosa*, the Pig plant from its unpleasant odour, has white flowers and is also a hedge plant in the West. Other white flowering Chilean species are *E. illinita*, also unpleasant in odour when in flower and *E. pterocladon*, the latter being another of LOBB's introductions, from Patagonia. Two others are rarely seen except in Botanic gardens and similar collections; they are *E. revoluta*, and *pulverulenta*.

Francoa is an old and well-known garden genus. *F. sonchifolia* is probably the hardest species and distinguished by the fact that the leaf stalks are winged. It has compact inflorescences of pink flowers. There is a figure in *Bot. Mag.* t. 3309. *F. appendiculata* has pale rose flowers and is figured in *Bot. Mag.* t. 3178, *Bot. Reg.* t. 1645 and also LODDIGES *Botanical Cabinet* 1864. The white flowered *F. ramosa* was once a popular cottage plant but is not so frequently seen now (*Bot. Mag.* t. 3824).

Hydrangea integerrima is an evergreen self-clinging climber with thick leathery foliage and panicles of white flowers. It grows up the trunks of trees in the Southern Provinces and was introduced into cultivation by MR. COMBER.

There are few genera in cultivation which exhibit such a range in size as Gunnera; two species are Chilean, *G. chilensis* (syn. *scabra*) and *G. magellanica*. *G. chilensis*, though not so large as *manicata*, can still claim to be one of the most imposing herbaceous plants with its enormous foliage and spikes of orange fruits. It is distributed throughout the whole length of Chile and the leaf petioles are still eaten as described by HOOKER in *Flora Antarctica*; the vernacular name he used "Panke" or "Panque" is also still in use. *G. magellanica* in contrast is a prostrate growing, mat-forming plant, with a carpet of dark shining leaves some 3 or 4 inches high. Coming as it does from the cold and wind-swept Straits of Magellan, it can claim to be the hardest species; it closely resembles some of the even smaller New Zealand species. The family to which they belong, Haloragaceae, is rather an odd one and has few good garden plants.

One of the commonest plants in the woods of Central Chile is the 'Arrayan.' It has had a chequered career from a taxonomic point of view, having been known as *Myrtus Luma*, *Eugenia Luma*, and *Eugenia apiculata*, while we are now told to call it *Myrceugenia apiculata*! It scrambles through other vegetation to an incredible length. It was one of LOBB's early introductions, but in most parts of Britain it must be grown under glass, or on warm sheltered walls. It has white flowers, large in proportion to the foliage, followed by black fruits (*Bot. Mag.* t. 5040). *M. Ugni* is no more hardy than the preceding but is sometimes grown on sheltered walls; it has smaller and more globose pinkish white flowers. The purple fruits are edible and are in fact sold in the markets of Chile. This plant was also introduced by LOBB (*Bot. Mag.* t. 4626). *Myrtus Lechleriana* was introduced by MR. COMBER under No. 1038 and is figured in t. 9523 of the *Bot. Mag.* It is much like *M. apiculata* but has smaller flowers and the leaves are less sharply pointed. Though I have seen the plant I have not yet grown it, nor do I remember

seeing it in Chile. A closely allied species *M. Cheken* was another Veitchian introduction; it is only suitable for the milder counties or for greenhouse cultivation, though it seems to have been fairly extensively grown at one time (*Bot. Mag.* t. 5644).

In the Onagraceae we find some very old garden plants both amongst the Evening Primroses and Fuchsias. *Oenothera acaulis* (*A. taraxacifolia* of gardens), is one of the best of the white Evening Primroses. It is extremely common in Central Chile and though the individual flowers are short lived, the display is continued for weeks; the flowers being produced on long prostrate trailing growths, radiating from a central crown. This crown is so like the Dandelion, indicated by its synonym, that many valued plants have been eradicated by well-meaning but uninitiated assistants. The large flowers open pure white, but change to a delicate pink before withering. It has been known since 1824 but does not seem to have been developed or "improved." There is an excellent plate in the *Bot. Reg.* t. 763. The plant sometimes seen labelled *O. acaulis* var. *aurea*, is really the N. American *O. triloba*. They are so much alike in habit and fruit that the mistake is not surprising. Though naturally a perennial it does not winter well, consequently it is usually raised under glass and treated as an annual. It can, however, be sown out of doors in April. It enjoys the distinction, unusual in this genus, of not having been split from the parent stock and provided with a synonym or sub-generic name. *O. odorata* hails from further south and is hardier though not a long-lived plant. Of slender graceful habit, it grows to 3 or 4 feet. The leaves are linear-lanceolate and the flowers soft clear yellow. There are two excellent figures, the first being *Bot. Reg.* t. 147. The text gives the information that the plant was introduced in 1790 by a ship's surgeon who collected it at Port Desire, Patagonia. The seeds were bought by SIR JOSEPH BANKS and flowered in the Apothecaries Garden at Chelsea in 1816. The text also adds that "it is now very common in our gardens and deservedly so from the elegance and singularity of the foliage and fragrance of the flowers." It has in fact become so much at home that it was recorded as a naturalised alien in the *Journal of Botany* in 1905. The *Bot. Mag.* figure is dated 1823, t. 2403. The equally delightful pale coloured variety *sulphurea*, comes true from seed, which in both is freely produced. *O. Bertolonii* is nearly allied but more sprawling and untidy in habit, I believe it was introduced by MESSRS. ELLIOTT AND GOURLAY. It is striking in the reddish staining of both stems and foliage, has flowers of a good clear yellow, and seems a good perennial.

Fuchsia magellanica, syn. *F. macrostemma*, 'El Chilco' trails its long flexible branches through other shrubs, intertwining and suspending its pendulous flowers for the benefit of the lovely little humming birds or "Picaflores"—delightful little creatures which seem to specialise in such inverted flowers as Fuchsia and Lapageria. It is of course a very old plant in cultivation, a number of forms were introduced and from these a considerable range of hybrids and varieties have been raised. One of the earliest figures is *Bot. Mag.* t. 97 and other forms are shown in var. *conica*, *Bot. Reg.* t. 1062, var. *discolor*, t. 1805, t. 847, t. 1052, and *Bot. Mag.* t. 2507. More recently the form collected by MR. COMBER, No. 1031,

gained the Award of Merit in 1930, and MR. ELLIOTT's unfortunately named var. *alba*, gained the Award in 1932. This has proved a vigorous and hardy form, although it is not white but pale pink. *F. lycioides*, syn. *F. rosea* has also been known in British gardens since 1796 when it was introduced by ARCHIBALD MENZIES and flowered in the King's Garden at Kew (*Bot. Mag.* t. 1024). It is extremely succulent and drought-resisting, losing most of its foliage during the hot dry summer of Central Chile. It produces hundreds of its pink flowers, small individually but striking en masse.

The Loasaceae is one of the most striking and interesting families to be found in Chile. Most of them, however, have undesirable traits, which do not recommend them as garden plants. They are mostly succulent and tender and many possess stinging hairs which can have most painful and persistent effects. Some of them are usually to be found in the Natural Order beds of Botanic Gardens where the sharp colour contrasts, curious structure of the corolla, and spiral dehiscence of some of the fruits always attract attention. The scarlet flowered species *Cajophora lateritia* is one of the best known, it is somewhat scandent in habit, and requires a few twigs to ramble over. It is figured (as *Blumenbachia*) in *Bot. Mag.* t. 3632. *Blumenbachia insignis* has white flowers followed by egg-shaped twisted fruits, it is straggly in habit and a foot or so high. It has been in cultivation since 1826 (*Bot. Mag.* t. 2865). There are over 30 species of *Loasa* in Chile alone, many of which have been introduced and lost. They are known collectively by the name 'Hortiga' or 'Ortigo' and many species are common to both sides of the Andes. *Loasa acanthifolia* was figured in 1824 in the *Bot. Reg.* t. 667. This is an excellent plate and clearly shows the curious structure of the flowers, and their bold scarlet and gold colouring. *L. tricolor* which is still in cultivation is similar in colouring and habit though smaller in all its parts. Both have vicious stinging hairs. *L. prostrata* was figured in the *Bot. Mag.* t. 6442. Another interesting member of the family and without its stinging hairs is *Scyphanthus elegans* (syn. *Grammatocarpus volubilis*) the Golden Cap flower. This is an annual with a twining or scrambling habit, resembling a *Tropaeolum*; it has rough stems, and clear yellow flowers, followed by cone-shaped spirally twisted fruits. Common in Central Chile it has been introduced and lost several times; it is figured in *Bot. Mag.* t. 5928, and was given the Award of Merit in 1929.

A number of Cacti are native to the drier parts of Chile, some are in fact one of the features of the landscape. The most striking is *Cereus chilensis* known as 'El Quisco'; it has numerous parallel columnar stems some 4 inches in diameter and 10 or 12 feet high, bearing white flowers and edible fruits, about the size and shape of a golf ball. Smaller but quite striking in its way is 'El sandillon' a plant of the sand dunes and coastal rocks. It is *Eriosyce sandillon*, a spiny barrel-shaped species, bearing rings of pink flowers round the crown of the stem.

I was never so fooled by a plant as by one of the Umbelliferae, *Eryngium paniculatum*. It has a spreading rosette of narrow, hard and spiny foliage, closely resembling a Bromeliad. I had provisionally labelled it as such and could scarcely believe my eyes when it flowered

and produced 3-foot-high inflorescences which were quite obviously an *Eryngium*. It is, I think, still in cultivation.

Relbunium ovale, a plant of Central Chile, closely resembles in habit its European relatives the *Galiums*. It scrambles up vegetation, wire fences, or other suitable means of support. A fence covered in this way is a lovely sight in autumn as the plant produces masses of small coral red fruits not unlike those of *Nertera depressa*. It has been in gardens more than once but appears to have died out once again. *Nertera depressa* is, of course, found in Chile as well as New Zealand, Tasmania, and Antarctica, but I have not seen it in the wild.

(To be continued)

AWARD OF GARDEN MERIT—LXXXIV

398 LILIAM DAVIDI

Award of Garden Merit, October 19, 1948

THIS fine Lily was fully described and illustrated in Part 6 of the Supplement to Elwes' Monograph of the Genus *Lilium* and the article which was reprinted in the 1949 *Lily Year Book*, also dealt with the systematic position of this Lily and its relationship to *L. Davidi* var. *Willmottiae*. It was first collected by PÈRE DAVID in 1869 in the high mountain range between Moupin and Szechwan in Western China and it was later introduced to cultivation from bulbs collected by E. H. WILSON.

Lilium Davidi is one of the easiest Lilies for the garden and will grow in full sun or in a semi-shaded position on the edge of a woodland. The flower spikes of a well-grown specimen reach 4 to 5 feet and bear numerous deep orange yellow flowers with recurved petals, heavily spotted on the inside with deeper colour. The variety *macranthum* is slightly more vigorous than the type and is probably the best one to grow. *L. Davidi* var. *Willmottiae* is separated from the type species by the longer and more drooping pedicels. It is one of the most floriferous and easily grown Lilies available for English gardens. Both the type and the varieties will grow in calcareous soils, although they are generally seen in better condition on neutral or slightly acid soils. It can be propagated readily from seed or from scales or from small bulblets produced along the underground rhizomes which often develop in this species.

399 MAHONIA PINNATA

Award of Garden Merit, June 2, 1947

This is one of the best of the early flowering Mahonias. It makes a rather larger shrub than the better known *Mahonia japonica* and specimens up to 10 feet in height can be seen. The flowers are pale lemon-yellow in colour, slightly scented and borne freely in upright racemes rarely exceeding 4 inches in length, while those of *M. japonica* are borne on lax racemes which, when the flowers are open, grow almost

horizontally. In *M. pinnata* these are not confined to the top of each branch but are also borne in leaf axils down the stem. The foliage is evergreen and each compound leaf bears ten or more leathery leaflets, sinuately spiny-toothed and slightly lustrous above, but not so glossy as those of *M. japonica*. A well-grown specimen provides a handsome feature in the garden at any season and the species is tolerant of a wide range of conditions, although it does not appear to be quite so hardy as *M. Aquifolium*. MR. BEAN described it as "altogether the most desirable of the Mahonia group." It is a native of Western N. America and was featured in the *Botanical Magazine* (t. 2396), under the name *Berberis fascicularis*.

400 PHILADELPHUS × NORMA

Award of Garden Merit, April 4, 1949

This is one of the finest of the hybrid Philadelphus sometimes known to gardeners as Mock Orange. They are among the best shrubs for garden decoration in late June and July and this hybrid is frequently laden then with large single saucer-shaped white flowers. Semi-double forms may also be found. Unfortunately the scent is not nearly so strong as in the majority of the species. The exact origin of this variety is not known, but it is included in the long list of good varieties raised by MESSRS. LEMOINE of Nancy and REHDER has suggested that it may be *P. × Lemoinei* × *P. grandiflorus* and includes it under his group hybrid name of *P. × cymosus*. It was given an Award of Merit in 1913. The growths are long and slender and often arch over, weighed down by the mass of flowers. They should be pruned after flowering by cutting away the old wood that has flowered. An open aspect is best for these Philadelphus, but they are tolerant of a wide range of soils and conditions in the garden and are absolutely hardy. They are easily increased by cuttings made from young shoots of the current year's growth.

401 RANUNCULUS FICARIA GRANDIFLORUS

Award of Garden Merit, May 13, 1946

This very fine form of the Lesser Celandine of our woodlands and marshes is distinguished from the main species, which itself is variable in size under different conditions, by the generally larger size of all its parts. It is figured in the *Botanical Magazine* (t. 9199), where a full description of its systematic position will be found. DR. W. B. TURRILL suggests there that it may be a tetraploid of the normal plant, and this has been subsequently established. It is found in countries bordering the Mediterranean from Spain to Syria but is hardy in English gardens and easily cultivated, although it does not spread so rampageously as our ordinary Lesser Celandine. The stems reach a height of 7 to 8 inches while the petals of the flowers are nearly an inch in length and half an inch in width, rounded at the apex but gradually narrowed below. The colour is the same bright yellow as in the Lesser Celandine and the petals shine in the same manner. It is a suitable plant for the rock garden or the wild woodland garden. It is said that it will thrive in drier situations than the British species.

402 *SALVIA AMBIGENS**Award of Garden Merit, October 17, 1949*

This attractive herbaceous plant which has been grown at Wisley under the name *Salvia coerulea*, is one of the best blue flowers for autumn decoration in the border and can frequently be found in flower during October as well as in August and September. The flowers are deep blue and are borne in terminal racemes of 6 inches or more on spikes up to 3 feet in height. It has been planted at Wisley in combination with the late yellow flowering *Hypericum* 'Rowallane hybrid' and the two make a good combination. It is hardy enough in this country to stand all except a very severe winter in the open. Unfortunately the name *S. coerulea*, under which it is generally known, belongs more correctly to another species and therefore has had to be rejected here.

403 *SPIRAEA DISCOLOR**Award of Garden Merit, May 30, 1949*

This is one of the best of the shrubby *Spiraeas* for mid-summer decoration, usually flowering freely during July. The individual flowers are creamy-white and small, but they are borne in large plume-like panicles often a foot in length, the size of the panicle depending on the cultivation and pruning. These panicles droop over at the end of long stems and are produced in great abundance. Pruning consists of cutting out the old wood after it has flowered. The longer of the young shoots may also be shortened if it is desired to keep the bush from making too great a height. If the young shoots are left unpruned it will in time reach a height of 15 feet. It is perfectly hardy and is suitable for an open or partly shaded position in the shrubbery or as an isolated specimen with a dark background. It was introduced by DOUGLAS from N. America in 1827. Some American botanists have split off the shrubby *Spiraeas* with the fruit an achene containing a single seed and have renamed this section, of which *S. discolor* is the commonest, *Holodiscus*, but this name has not been widely adopted as yet in this country.

404 *TULIPA SPRENGERI**Award of Garden Merit, July 26, 1949*

This fine species from Asia Minor is the latest of all the *Tulips* to flower, often blooming at the end of May. It is a good garden plant often establishing itself in light shade under shrubs and seems to do best when left alone, sometimes seeding itself freely about. The flowers are single, light crimson scarlet in colour, the three inner segments being slightly darker than the outer ones. These outer segments are marked longitudinally with yellowish buff. There is no basal blotch. This species may be distinguished by the long, rather narrow and pointed perianth segments. The backs of the inner segments show a well-marked mid-rib, with two channels. SIR DANIEL HALL in *The Genus Tulipa* also reports that it is unique in the character of its filaments and stamens and he is unable to fit it into any of the sections.

405 VIBURNUM BITCHIUENSE

Award of Garden Merit, July 26, 1948

This is one of the finest of the Viburnums, usually flowering in April and May and resembling *V. Carlesii*. It is, however, a slenderer and more open growing shrub, often reaching a height of 8 feet and as much across. The flowers are loosely arranged in panicles 2 to 3 inches across and are tinted pink on the outside of the buds, but the flowers open white. They are nearly as fragrant as those of *V. Carlesii*. It is a native of Western Japan, and takes its name from the province of Bitchiu. (Fig. 110.)

It should be given an open position in the garden or in light woodland where it will have sufficient space to develop. It is only as a large bush that it really shows its quality and, as such, many authorities have considered it superior to *V. Carlesii*.

BOOK NOTES

"Drawings of British Plants." By Stella Ross-Craig. Part III. 77 plates. (G. Bell & Sons Ltd.) 9s.

The first two parts of this excellent series of black and white illustrations were reviewed in this JOURNAL 74, 48 (Jan. 1949). The third part, devoted entirely to the family Cruciferae, maintains the same high standard. The details of flower structure, etc., so accurately and clearly portrayed should make it a valuable help to the teaching of botany, and it is certainly indispensable for all who are interested in the flora of the British Isles or indeed that of north-western Europe as a whole. The horse-radish (*Armoracia rusticana*, syn. *A. lapathifolia*) and the coral-root (*Dentaria bulbifera*) are the only species of which the seed and mature fruit are not illustrated, presumably because they propagate almost exclusively by vegetative means in Britain. Perhaps a supplementary plate could be published later if mature fruits of British origin become available to the artist.

W. T. STEARN

"Annuals." By Roy Hay. Second Edition. 240 pp. Col. plates., Illus. (John Lane, The Bodley Head.) 12s. 6d.

The first edition of this book appeared in 1937 and was reviewed at length in this JOURNAL 62, 422 (1937) by the late Viscountess Byng of Vimy. She noted that it filled a gap which had been empty for some time, and the same is true of the present edition. A number of new varieties are mentioned and there are more coloured plates, but the text as a whole has not been greatly altered. Since this is a reference book, some of the lesser known annuals such as *Delphinium orientale* and *Tolpis barbata*, which often occur in botanic garden seed lists, might well have been included. This new edition is nevertheless a welcome addition to the list of standard horticultural books which passed out of print during the war years but have now become available again.

"Manual of Bacterial Plant Diseases." By W. J. Dowson, M.A. D.Sc. (Adam & Charles Black.) 16s. net.

It is not generally realized that among the losses suffered in our crops due to attacks by fungus parasites, viruses, and the like, those ailments due to infection by the incredibly small organisms known as bacteria are not to be despised and certainly cannot be ignored. There are many important diseases of horticultural plants caused by bacterial infection but the specialized and careful technique required for close study of them causes many workers to fight shy of becoming too interested in this branch of plant disease investigation. Dr. Dowson has for many years been engaged in the investigation of plant diseases and has paid particular attention to those caused by bacteria and we are indebted to him for much original work not only on specific diseases but also in providing us with much guidance on the proper nomenclature and classification

of the pathogens concerned. He has now provided us with this book from which research workers and students in plant pathology can obtain the most up-to-date information they could wish for on the subject.

The book is divided into three main parts. The first part gives chapters on the general characters of bacteria, on their nomenclature and classification as advocated by the author in comparison with older systems, on symptoms which indicate bacterial infection in plant tissues and on how to begin an investigation of such troubles. Part II is concerned with the preparation of many kinds of media, its sterilization and standardization, as well as the biochemistry of bacteria and technique for staining them before microscopic examination is commenced. Part III discusses various economic diseases caused by bacteria including not only all those known in Britain but many others which although so far only known abroad may yet at some time become a menace here. There are maps showing the world distribution of eighteen important diseases, there are references to all the important work done on bacterial plant troubles and there are fifty-four photographs of very good quality.

To research workers, students and even advisers in plant pathology, this book is most welcome, as the last one of its kind was published twenty years ago in America. We have no doubt at all that it will be of the utmost assistance to everyone engaged in research on plant diseases. It is well written and well published and the price is most reasonable. Although the errors may not be serious it is a pity that an errata slip was not included.

D. E. GREEN

"Gall Midges of Economic Importance." By H. F. Barnes. Vol. 6. "Gall Midges of Miscellaneous Crops." 229 pp. and 14 plates. 15s. net. (Messrs. Crosby Lockwood & Son, Ltd. 1949.)

This is the fifth out of eight volumes to be published, and appears before Volume 5, which is in preparation. The subject matter deals with Gall Midges injurious to Bamboos, Basket Willows, Beverage plants (Cocoa, Coffee, Tea, Hop), Dye and Fibre plants; aromatic, culinary and medicinal Herbs; Insecticide plants, Rubber, Spices and Sugar plants.

This volume will appeal to an even wider circle of biologists and horticulturists than those formerly published by reason of the detailed information concerning the economic uses of the host plants in addition to the entomological aspect. Such data will appeal to all whose interest lies in plants and plant products additional to "those that provide food, beauty, shade and timber for man and his animals" by the inclusion of plants used for beverages, dyes, fibre, oil, rubber, insecticides and herbs.

The format is similar to that of the previous volumes, while the high standard of illustrations is maintained.

The global review of these important plant pests and of the wide range of host plants included is a further indication of the meticulous care that has been taken by the author to provide authoritative data on the subject of Gall Midges.

G. FOX WILSON

"Adrian Feint: Flower Paintings." Ed. by S Ure Smith. Introduction by Tatlock Miller. 12 col. pl. 16 monochrome pls. (Pub. by Ure Smith Pty., Ltd., Sydney.) 1948. £3 15s.

Mr. Feint is well known as a many-sided artist in his own country and this book will form a welcome introduction to his art for many people in this. As the title indicates, only his flower studies are represented in this series of plates; and the flowers, whether distinctively Australian or not, are of cultivated types and shown mostly in mixed groups, in vases, in a curtained recess or more often on the window-sill of a room with a view. The background is often the sea, and composition and atmosphere are dignified, harmonious and peaceful, seeking no merely sensational effectiveness. The colouring of the originals is no doubt more lively than in the plates, for the best colour printing has its limitations.

A more whimsical note appears in the coloured woodcuts which adorn the text. Has anyone before Mr. Feint realized the comic possibilities of shells? "Poor relations" is a delightful piece of fun; and "Strange Shore" has its own eerie suggestiveness, but shells with almost human characters, flying, dancing or resting, fill the pages.

In a preliminary essay Mr. Tatlock Miller succeeds in briefly indicating, characterizing and interpreting the main developments of flower painting throughout history.

The book is beautifully produced in respect of typography, paper and binding by a publisher—Mr. Sydney Ure Smith—who is himself well known as a painter and etcher. May we hope that he will give us before long in another volume a selection of Mr. Feint's landscapes?

F. M. G. CARDEW

"Outdoor Grapes in Cold Climates." By R. Barrington Brock, M.B.E., F.R.I.C., B.Sc., F.R.P.S. 71 pp. (Tunbridge Printers, Ltd.) 6s.

At the mention of Grapes the English gardener's thoughts immediately turn to the greenhouse, yet at one time the vine used to be successfully grown out of doors in this country.

The author has set himself the task of demonstrating that choice varieties of Grapes can be grown out of doors under cloches and that the growing of Grapes, both for the table and for wine-making, may be a worth-while proposition without glass of any kind.

In the spring of 1946 the author laid down his experimental vineyard at Oxted and he intends to investigate there all the cultural problems that arise. In this little book which is in the nature of a first report of the work so far accomplished, Mr. Barrington Brock describes his methods of culture, the qualities of the varieties under cultivation and the results so far obtained. There is a short chapter on propagation and another on pests and diseases in which timely warning is given of the very real risk of introducing the pest *Phylloxera* into the country on imported planting material and packing. The final chapter contains tentative recommendations as to suitable varieties to plant in different situations and short notes on their management and cultural requirements.

Mr. Barrington Brock is an enthusiast, his love for his vineyard is infectious and we feel that this first report from his experimental station will appeal to all lovers of good fruit who wish to experiment with the vine on their own ground.

E. ROBINSON

"The Huntington Botanical Gardens 1905-1949." By William Hertrich. 167 pp. 4to. (The Huntington Library, California.) 5 dollars.

This well-illustrated account of a now celebrated garden has as a sub-title "Personal recollections of William Hertrich, Emeritus Curator." The book is printed by order of the Trustees of the Henry E. Huntington Library and Art Gallery at San Marino, California, as a tribute to William Hertrich on completion of 45 years as Superintendent of the estate of Henry E. Huntington and as Curator of the Huntington Botanical Gardens. Mr. Huntington acquired a ranch in 1902 and in 1904 the author entered his service to superintend its conversion into a residential estate with gardens designed not only for beauty but to test the adaptability of plants from regions with a similar climate for the region around. Great collections of palms, cacti, as well as a great variety of other plants were brought together with this end in view. Mr. Hertrich played his part in all the developments and now tells the story of the growth of the garden, the building of the residence to contain treasures of art and literature, and how, on its founder's death in 1927, the grounds of 200 acres and buildings were put in trust for public use. Of the 167 pages in the book 64 are occupied by illustrations from photographs of scenes and plants.

"Botanik der Gegenwart und Vorzeit in culturhistorischer Entwicklung: ein Beitrag zur Geschichte der abendländischen Völker." By Karl F. W. Jessen. xxii + 495 pp. (1864, republished in 1948 by Chronica Botanica Co., Waltham, Mass., U.S.A.; Wm. Dawson & Sons, Ltd., London, W.C. 2) \$6.00.

This volume is the first in a series of facsimile reprints of out-of-print and classic scientific books which the enterprising Chronica Botanica Company proposes to publish under the title *Pallas*. As the editor states, Jessen's work, though originally published in 1864, still remains "the best concise all-around history of botany ever attempted." It is less detailed than Ernst Meyer's massively erudite *Geschichte der Botanik* (1854-57), which occupies over 1,800 pages without extending beyond the year 1600, but Jessen brings the history of botany down to 1860, the year in which Darwin's *Origin of Species* was first translated into German. Read as a continuous narrative it gradually builds up a picture of the development of man's long interest in plants from the utilitarian aspect into botany as a many-sided science. A student of Georg Gervinus, the historian and commentator on Shakespeare, Jessen saw botany not simply as the amassing of facts about plants but as a manifestation of the cultural and intellectual progress of the European peoples. His accounts of individual botanists and their work thus relate them to the knowledge and ideas of their times. As a reference book this history is of particular value for the concise appreciations as well as for the essential facts which it gives about almost every writer of note on plants from the earliest records down to the middle of the nineteenth century, and no later one-volume work has completely superseded it.

W. T. STEARN

"Chemistry of Insecticides, Fungicides and Herbicides." By Donald E. H. Frear, Ph.D. (Macmillan & Co., Ltd.) 417 pp. Illus. 33/-.

This is intended as a guide to the various insecticides, fungicides and herbicides in present use, accompanied by much chemical description. Unfortunately, in the selection of such data some items of a redundant or even erroneous nature have crept in. Nevertheless, it will be found interesting and useful to chemists and those students able to study it with discrimination.

The author has inserted a great volume not always clearly written of pure chemistry to the detriment of the insecticidal study of the materials. The methods of analysis are concise and a useful guide, but a number are already out of date.

GEO. S. WOODCOCK

"Fruit Tree Raising, Rootstocks and Propagation." (Bulletin No. 135. Min. of Agriculture. 46 pp. Ill. H.M.S.O.) 1s. 3d.

This bulletin is primarily intended for the specialist raiser of fruit tree stocks. It has been compiled under the guidance of experts from East Malling and Long Ashton research stations and can be recommended to those engaged on raising commercial stocks of fruit trees. Apples, Pears, Plums and Cherries are the fruits dealt with and in each case there is a discussion of suitable rootstocks and the methods of raising them. This is followed by sections on budding, grafting, pruning and pest and disease control in the Nursery.

"Trees have Names." By Adrian Hill. (Faber & Faber.) 80 pp. Illus. 21s.

This book is a collection of drawings of forty native or commonly cultivated British trees. The artist has succeeded for most of them in sketching the same tree from the same position in both its Summer and Winter states. Details of leaves accompany his excellent and pleasing representations of habit of growth, but flowers, even of such trees as the apple, the tulip-tree and the robinia, are ignored. The loving care bestowed upon the drawings did not extend to the text in which occur such extraordinary statements as that the ginkgo is "reputed to be the world's original tree"! Since the title announces that trees have names, not in itself a very startling discovery, the author is presumably well acquainted with them, but those who hope by his aid to ascertain the botanical names of the common trees will be disappointed; there is not one in the book and some of the English names used lack precision. As he himself says, "first and last it is a picture book." It deserved an apter title, and a more accurate text to match the quality of its honest and charming illustrations.

W. T. STEARN

"Bouquet." By G. S. Whittet. 181 pp. Col Pls. (Studio Publication.) 21s.

"Bouquet" is a 'gift-book' of reproductions of forty-eight flowerpieces with a brief introduction and comments on the individual plates. Its flowers have mostly been culled from back numbers of *The Studio*, a procedure which certainly makes for economy of production. Forty-five of the paintings reproduced are by twentieth-century painters—some good, some bad and some indifferent; to these have been added, perhaps because colour-blocks were available, a Cézanne, a Van Gogh and a Hokusai colour woodcut. The colour plates are on the whole well reproduced; but they are set in elaborate and unattractive pea-green frames, presumably so that the book may acquire a size and importance that makes it seem a reasonable purchase at a guinea. The introduction appears to have been composed for a book dealing with the history of flower-painting from palaeolithic times to the present day. Such a book, with carefully chosen illustrations of flowerpieces of all ages and accurate and informative text would be welcomed by artists and flower-lovers alike; but it is hard to see what real purpose has been served by the publication of the present volume.

"Crop Management and Soil Conservation." By J. F. Cox and L. E. Jackson. Second Edition. Illus. 572 pp. (John Wiley and Sons, Inc. New York; Chapman and Hall Ltd. London) 23s.

Farmers and market gardeners in Britain are fortunate in not having soil erosion problems among the many with which they have to deal. Our much maligned insular climate can at least be thanked for this. Conditions are vastly different in continental America, Africa, and Australia where violent rainstorms might wash away overnight the topsoil of a flourishing farm or dust storms cover it with infertile soil in a single season. Soil conservation must thus be for ever in the mind of the continental agriculturist. In this book is found a store of practical information on the production of crops in relation to soil conservation, into which all would-be farming emigrants to the Colonies and Dominions could dip with profit. It should be particularly useful to

farmers in South and East Africa where temperate crops are grown under climatic conditions conducive to soil erosion. Maize, Wheat, Barley, Buckwheat, Sorghum, Soybeans, Cow peas, Clovers, and Potatoes as well as pasture management are discussed in detail.

E. H. CHENERY

"Hearts-Ease. Herbs for the heart, the ductless glands and the nerves." By Mrs. C. F. Leyel. (Faber & Faber.) 333 pp. 21s.

The more one dips into this book, the more one wonders why it was published. It cannot be considered as a serious contribution to the use of plants in the treatment of disease. Such information as it contains is presented in monograph form, but appears to be derived mainly from ancient authorities like Gerard and Culpeper. The virtues of Hearts-ease appear to rely as much on a lyric by Herrick as any other evidence, while Heart Trefoil, it seems, depends on the long discredited doctrine of signatures. But what is Heart Trefoil? Three botanical names are given, apparently synonyms, *Medicago maculata*, *Trifolium cordatus* and *Medicago lupulina*. *Trifolium Cordatum* (all names as printed) we are told comes from Gerard. The rather inconsequential arm-chair discussion that follows leaves one wondering whether Heart Trefoil is one or two plants and with the idea that it would be an excellent plan to look at the plants and find out. Although lack of precision may not matter with such innocuous drugs, it is deplorable in the more potent. The active principles of Foxglove are referred to as alkaloids in the preface and as glucosides in the monograph, while the relative proportions and percentage of alkaloids in *Scopolia* (*sic*) differ widely from those given in standard textbooks. Horticulturists may chuckle over such incongruities as *Rhododendron Chrysanthemum* and teetotallers may take their brandy as 'Cordial poppy water'—as a medicine of course! Incidentally one gains the impression that there is only one *Rhododendron*.

R. MELVILLE

"Compassionate Herbs." By Mrs. C. F. Leyel. (Faber & Faber.) Demy 8vo. Illus. Price 12/6.

This book with its lurid and passionate red cover is devoted to the study of herbs used for healing. Mrs. Leyel is the founder and chairman of the Society of Herbalists and so writes with authority and experience. The book is full of interesting old lore and wisdom on the subject, much of which is little heeded to-day. It is illustrated with delicate drawings by Mildred Eldridge. The number of country and continental names given for each plant adds value to the book and there can be few books which are so complete on this subject. Unfortunately, the book contains no cultural details.

"School Gardening in the Tropics." By R. O. Williams. Crown 8vo. 143 pp. Illus. (Longmans.) 3s.

This little book should be of great assistance to all those beginning a garden in the Tropics as well as to the school teachers for whom it is specifically intended. The text is clear and concise and it is illustrated by effective line drawings, which demonstrate the methods described. The author has had experience in the West Indies, Trinidad, Palestine and Zanzibar.

"Preliminary Check List of the Flowering Plants and Ferns of Griqualand West (South Africa)." By M. Wilman. Royal 8vo. 380 pp. (Deighton Bell & Co., Cambridge, Alexander McGregor Memorial Museum, Kimberley.) 45s.

This list is probably the most complete yet published of the plants of this region. There are no descriptions of the plants but the local distribution and where possible Afrikaner names are given. There is a farm map indicating the collecting areas compiled by Mr. J. P. H. Acocks. This volume should be used in conjunction with Dr. J. Burt Davy's *Manual of the Flowering Plants and Ferns of the Transvaal and Swaziland*, but unfortunately only two parts of this Manual have so far appeared.

"Cultivation of Watercress." (H.M.S.O. Illus. 1/- net.)

This is Bulletin No. 136 in the series published by His Majesty's Stationery Office for the Ministry of Agriculture and Fisheries. This Bulletin has been largely prepared by Mr. Charles H. Sansom, the Chairman of the Watercress Branch of the National Farmers' Union, and carries very full directions for the choice of situation and construction of Watercress beds. It has been found that water from the Chalk and Greensand formation are usually suitable for Watercress growing, while the temperature of the water is the most important influence affecting the rate of growth.

While primarily intended for the commercial grower this Bulletin should be valuable to all who have a suitable source of water in their gardens and wish to establish a bed of Watercress. There are few plants richer in Vitamin C.

"Wild Flowers in the Rockies." By George A. Hardy and Winifred V. Hardy. Pp. 125. Illus. (H. R. Larson Publishing Co.) \$7.50.

A well-produced and profusely illustrated small book which might well serve as an introduction to the wonderful flora of the Rocky Mountains and their environs. It is too elementary to be of particular interest to the advanced student. The almost lyric prose in which the descriptions are written makes easy and pleasant reading.

All the illustrations are in colour and form the major part of the book. The drawing is good and, in most cases sufficiently accurate, but the colouring is frequently over optimistic and in one or two instances distinctly misleading. This applies very particularly to the illustration of *Saxifraga oppositifolia*. There never was a *Polemonium* as blue as the colour depicted for *P. occidentale* and the colouring of *Epilobium latifolium*, which I have seen and admired in its native habitat, leaves much to be desired.

The naming of the plants is on the whole reliable, although *Primula mistassinica* is listed beneath its obsolete synonym of *P. Maccalliana*. *Claytonia*, related to the *Lewisia*s and a member of the *Portulacaceae*, is given as a member of the *Pink* family. There are few faults in the spelling but *Chimaphila* is incorrectly spelled 'Chimphila.'

With so much excellent material available I think it is rather unfortunate that the authors should have selected for illustration so many of the common and less beautiful plants. The following examples are all little better than weeds and possess no garden value. *Geum strictum*, *Potentilla dissecta*, *Crepis elegans*, and *C. nana*, various *Senecios* and, in particular, *Lynchis apetala*. It is to be hoped that the authors and the artist will continue this work and, if possible, devote more attention to the innumerable really beautiful flowers which grow on and near the vast ranges of the Rocky Mountains.

WILL INGWERSEN

"Roses for Southern Gardens." By Bessie Mary Bird. 96 pp Illus. (University of North Carolina Press; Geoffrey Cumberlege.)

The author is an enthusiastic amateur gardener who grows perhaps a hundred or so Roses in her "yard," and has written a "light-hearted treatise on Roses for Southern gardens (of North America). It is gay and witty, chatty and informal." The book is beautifully produced in a manner which makes us a little envious of the facilities which are not yet available in this country, and the pictorial value is greatly enhanced by the very fine colour plate illustrations, which, however, we have already seen published elsewhere. Of the ten Roses selected as the best for growing, only four are well known or thoroughly tested in the British Isles and English readers should treat these lists with considerable reserve, for in the past many varieties highly successful in the U.S.A. have been proved to be of little value here. The general conditions and the cultural recommendations are so different in Georgia that, while it is always interesting to know how other gardeners work, the book can be of little practical use for the English amateur.

Mrs. Baird describes standard Roses as being "two buds of any variety inserted in one end of a smooth stem, IXL or Multiflora, the other end of which is grafted on a wild understock"!! Well, well! Several pages are devoted to Fertilizers and the pH of the soil. Superphosphate is "pH 2 or 3, but it does not give acid reaction"!! Bone meal is "pH 10-2, when first applied is slightly acid forming"!!! and so on. Her manuscript was apparently submitted for assistance to several well-known scientists and horticulturists, but it is a pity that her final copy was not more adequately expertized.

BERTRAM PARK

"A Gardener's Log." By Edna Walling. (Oxford University Press, Melbourne.) Aus. Retail Price 15s.

This book appeared originally through the medium of letters in the 'Australian Home Beautiful.' It consists of short sections, written in an easy conversational style, about gardening of various kinds in Australia. The four seasons are covered by four separate chapters. It is interesting to an English reader to see how so many plants found in English gardens fare in Australia. The author, who is a practical and experienced gardener, rightly pleads for more intelligent use of the beautiful native trees and shrubs. It is satisfactory to know that the planting at Canberra meets with her warm approval.

J. W. HUNKIN

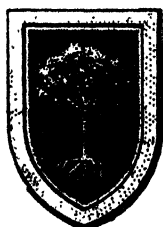
"How to grow Annuals." By Ann Roes Robbins. Cr. 8vo. 30 pp. (Macmillan & Co.) 26s. 6d.

This book was written to assist North American amateur gardeners and consequently many of the varieties mentioned will not be easily available in this country. The author has chosen twenty-five of the most popular of annuals grown in American gardens and describes these and recommends the best varieties. These descriptions are preceded by general chapters on cultivation and the book is illustrated with small drawings at the head of each description. A list of other annuals together with short notes is included at the end of the book.

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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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Part 6

June 1950

THE SECRETARY'S PAGE ANNOUNCEMENTS—JUNE AND JULY

Shows, Lectures and Meetings

TUESDAY, JUNE 6. 12 NOON TO 7 P.M. } *Iris Society's*
WEDNESDAY, JUNE 7. 11 A.M. TO 5 P.M. } *Show.*

TUESDAY, JUNE 13. 12 NOON TO 7 P.M. First day of Fort-
nightly Show.

British National Carnation Society's Pink Competition.

3 P.M. LECTURE: "The Cooking of Vegetables" by MONSIEUR F.
VINCENT.

WEDNESDAY, JUNE 14. 10 A.M. TO 5 P.M. Second day of Show.

TUESDAY, JUNE 27. 12 NOON TO 7 P.M. First day of Fortnightly
Show.

Flowering Tree and Shrub Competition.

First day of National Sweet Pea Society's Show.

3 P.M. LECTURE: "Hybridizing of Lilies: an amateur's approach"
by MR. O. E. P. WYATT.

WEDNESDAY, JUNE 28. 10 A.M. TO 5 P.M. Second day of Show.

Second day of National Sweet Pea Society's Show.

FRIDAY, JUNE 30. 12 NOON TO 7 P.M. *National Rose Society's*
Show.

TUESDAY, JULY 11. 12 NOON TO 7 P.M. First day of Fortnightly
Show.

Summer Fruit and Vegetable Competition.

First day of British National Carnation Society's Summer Show.

Cactus and Succulent Society's Competition.

3 P.M. LECTURE: "Border Carnations" by MR. M. C. ALLWOOD,
F.L.S., V.M.H.

WEDNESDAY, JULY 12. Second day of Show.

Second day of British National Carnation Society's Summer Show.

Demonstrations at Wisley—The following demonstrations will be given at Wisley, that on the second day being a repetition of the demonstration given on the first:—

Flower Garden

May 31, June 1. Summer Pruning of Shrubs. (2–4 P.M.)

Fruit Garden

July 5, 6. Summer Pruning of Fruit Trees. (2–4 P.M.)

British Delphinium Society's Show—Fellows are asked to note that the date of the British Delphinium Society's Show is incorrectly shown on Fellows' tickets and in the Society's Diary. The British Delphinium Society will hold its annual competition in the Westminster Dragoons' Hall in Elverton Street, Westminster, between 12 noon and 6 P.M. on Wednesday, June 28, the second day of a Fortnightly Show. The Westminster Dragoons' Hall is just across the street from the New Hall, at the junction of Elverton Street and Horseferry Road. Fellows' and Associates' tickets will admit between the hours stated above.

Colorado Beetle—The Ministry of Agriculture and Fisheries asks that notice may be drawn to the danger of the establishment of the Colorado beetle in this country. Although no breeding colonies of beetles were discovered in England or Wales during 1949, numerous beetles arrived on imported produce. Moreover, weather conditions on the Continent towards the end of the year were favourable to the beetle, and there is the possibility of a serious infestation in Europe during the Spring of 1950 with the consequent grave danger of the introduction of beetles into this country. It is most important, therefore, that any discoveries should be dealt with by the Ministry before the pest has time to spread or multiply.

Any yellowish beetle with black stripes running up and down the beetle, not across, or any red or reddish-yellow grub that is found feeding upon potato leaves should be regarded with suspicion. When grubs or beetles suspected of being Colorado beetles are discovered, specimens should be placed in a tin box (in which no holes should be punched), with a piece of potato leaf, and the box should be sent to the Ministry of Agriculture, Plant Pathology Laboratory, 28, Milton Road, Harpenden, Herts., with a letter stating the exact place where the insects were found and the name and address of the finder. Nothing more should be done until instructions are received from the Ministry.

Some Good Garden Plants—This book contains descriptions of all the plants, which have received the Award of Garden Merit from 1922 to 1949, having been recently revised to incorporate awards made since the last edition was published in 1945. A number of new illustrations have also been added. This book, which is bound in paper boards, is obtainable from the Secretary, price 6s. post free, and should be of value to all gardeners.

Pamphlet—*The Production of Quality in Apples*, by PROFESSOR T. WALLACE. The report of this lecture has been reprinted as a pamphlet and is available, price 1s. post free.

WISLEY IN JUNE

WITH the arrival of summer the Gardens reach the height of their beauty, and with so much of interest it is difficult to select items for special mention in these notes; but certainly the Floral Trials, the Rock Garden, the Wild Garden, and the Roses, both old and new, are among the most attractive features.

Many visitors like to go first to the greenhouses, and on the way there the shrubs growing near the walls of the Laboratory should be seen. *Indigofera hebeptala*, with deep rose flowers, and *Sophora viciifolia*, with lilac blossoms, are two Leguminous species rather infrequently seen in small gardens; *Abelia Schumannii*, already producing the first of its mauve, tubular flowers will continue for many weeks; *Senecio laxifolius* has large bunches of golden, Daisy-like flowers above silvery foliage. At the North end of the Laboratory there is a large bush of *Jasminum* \times *stephanense*, the result of a cross between the red-flowered *J. Beesianum* and a form of *J. officinale*. It does not appear to flower very freely while young, but in older specimens every long, wiry shoot is wreathed with faintly-scented pink blossoms.

In the Half-hardy house there will be *Alstroemeria haemantha*, a vigorous grower with 5-foot stems bearing huge panicles of salmon-red flowers, and the aptly-named *A. violacea*, a smaller plant of somewhat unusual colouring. The large white, pink-tinged spathes of *Arisaema candidissimum* have appeared among the bold, three-parted leaves, and there should be white, Iris-like flowers on *Moraea iridioides*, which usually produces several crops during the year. *Anigozanthos flavida*, the Kangaroo Paw, is almost always in bloom, the tall inflorescences each producing a long succession of flowers.

Among the permanent occupants of the Temperate House, we may note *Lonicera splendida*, a Spanish Honeysuckle with sweet, creamy flowers and glaucous, blue-green foliage; *Ochna multiflora*, a neat bush covered in Spring with bright yellow blossoms, now succeeded by scarlet-sepalled black fruits; *Elaeocarpus cyaneus*, an evergreen tree with elegant sprays of fringed white flowers to be followed by small blue berries; and the flamboyant 'Bottle-brush,' *Callistemon citrinus*. The side-benches in this house will, as usual, be occupied by a large variety of pot-plants in flower. Many other decorative plants, especially those with ornamental foliage, will be found in the Stove house.

Beside the walk leading to the Rock Garden the bearded Irises will be at their best early this month, and in a bed not far away there is a selection of the older Roses, many of them richly fragrant and showing great variation in form and colouring. Some really beautiful things include the white Damask 'Mme. Hardy,' the equally pure Moss 'Blanche Moreau' and the mauve-pink Cabbage 'Tour de Malakoff.' For stronger colouring one must look to the Gallicas, like the velvety crimson-purple 'Tuscany,' 'Hippolyte' of Fuchsia-purple, and the curious 'Cardinal de Richelieu,' almost a blue-purple.

Very extensive new plantings of Primulas have been made in the Wild Garden, and in early June the species of the Candelabra section, such as *P. japonica*, *P. pulverulenta*, *P. helodoxa* and *P. chungensis*, and their

garden hybrids, will be very prominent. The species of *Meconopsis*, especially the popular blue *M. betonicifolia*, should also be good. Numerous additions have been made in the last two or three years to the collection of Lilies here, and at the time these notes were written most were through the ground and growing vigorously, so we may confidently expect a good display this year. Among the earlier ones, in June, there will be *L. rubellum*, with rose-pink, trumpet-shaped flowers, *L. Szovitsianum*, bearing solid yellow flowers of the Martagon form on tall, strong stems, the bold, fiery-red *L. umbellatum*, and the rather inconspicuous, but easily grown *L. pyrenaicum*. Of the many outstanding trees and shrubs flowering here in June, *Magnolia* × *Watsonii* is probably the least likely to be overlooked, for its handsome ivory-white blooms exhale a very strong, lemon-like odour. The smaller, creamy blooms of *M. virginiana* are more agreeably scented, and appear in succession for several weeks. *M. Sieboldii*, probably the most generally useful of the three, also has a long season. *Styrax japonica*, an exceedingly floriferous and graceful little tree, should not be missed, nor should the numerous large bushes of *Kalmia latifolia*, the North-American 'Calico Bush,' and its compact variety *myrtifolia*, covered with neat pink posies of blossom. The lilac-coloured *Rhododendron azaleoides*, a hybrid of unknown origin, together with two deciduous North American species, *R. viscosum* and *R. arborescens*, both of which have tubular white or blush flowers, bring the Azalea season to a fragrant conclusion.

In Seven Acres the large specimens of *Genista cinerea* and *Spartium junceum* are the most conspicuous features. Both are admirable shrubs for sunny places in dry soil, where they flower very freely. *Buddleia alternifolia*, distinct from all other species not only in its leaf arrangement but in its elongated, wand-like, mauve inflorescence, has been growing here since plants were first raised in this country from Reginald Farrer's seeds. Escallonias are very gay here at the present time, and some of the hybrids, such as *E.* × *langleyensis* and *E.* 'Apple Blossom' are almost indispensable. The handsome white *E. Iveyana*, flowering a little later, never shows itself to advantage here unless planted close to a sheltered wall; and even with that protection *E. montevidensis*, perhaps the finest of all, and for a few years a late summer feature of Wisley, finally succumbed during a severe winter.

Lovers of alpine plants will not fail to find plenty to interest them in the Rock Garden. The greatest masses of colour come from patches of *Violas*, *Campanulas* and *Dianthus* of many kinds, *Helianthemums* covered with delicate flowers replaced every morning by a fresh crop, and certain plants of especially vivid hues, such as the dazzling *Verbena chamaedryfolia*, the near-magenta *Lychnis Viscaria splendens* and *Anagallis collina* of striking Nasturtium Red. Strong contrast is provided by *Genista Lydia* and *G. dalmatica*, both yellow-flowered, and much cooler colour by *Phlox canadensis* and *P. argillacea*, the pearly-blue *Codonopsis ovata* and the prettily pencilled flowers of *C. clematidea*. In the cooler, moist nooks one will find the varieties of *Primula alpicola*, bearing fragrant purple, cream or white bells, *P. Littoniana* with scarlet-tipped lavender spikes, the Madeiran *Orchis foliosa* with densely

arranged purple florets, or *Incarvillea Delavayi* displaying crimson trumpet-shaped flowers on tall leafless scapes.

The Alpine House continues to provide an ever-changing selection of rare and choice plants, although its principal period of bloom is long past. The first of a long succession of Campanulas has made its appearance; the sturdy little *Rhodohypoxis Baurii* and some of the Lewisias continue in flower; and these are accompanied by Acantholimon with neat pink sprays, *Allium acuminatum* with persistent flowers at first mauve, later becoming papery, *Nierembergia caerulea*, suggesting a dark blue, bushy Convolvulus, *Pinguicula caudata*, a large, pink-flowered Butterwort, and many others of equal merit.

On Weather Hill the hybrid Roses in the long borders and Chinese Paenies near the old Pear orchard will be flowering. The Rhododendrons and Azaleas on Battleston Hill, where much development has taken place recently, reached their peak last month; but in June there will still be plenty to see, both in the Trials and in the Woodland Garden over the bridges, where *R. Griersonianum*, the parent of so many fine hybrids, should be at its best.

HERBACEOUS ROCK GARDEN PLANTS

SOME INTRODUCTIONS FROM THE HIMALAYA AND S.W. CHINA

W. G. MacKenzie

(Lecture given March 21, 1950, MR. W. E. TH. INGWERSEN in the Chair)

I HAVE taken for my subject this afternoon "The Contributions of the Himalaya and S.W. China to our rock gardens." We are now mid-way through the present century and it would be of interest to consider the rich contributions which these areas have made over the past fifty years. It is proper, too, that we should remember the many plant collectors whose unstinted efforts have enriched our gardens and whose trophies each year give so much pleasure. It is not difficult to appreciate what our wild or woodland gardens owe to such collectors and how their introductions have changed the whole succession in our rock gardens so that there is always something of interest to be seen. Then, of course, there have been many notable additions from South East Asia to tree, shrub and herbaceous collections. There is no doubt that we are fortunate to have lived in an era of such rapid expansion in horticultural interest and to have witnessed the establishment of so many fine new plants in cultivation. Even the intervention of two world wars did not succeed in stemming this progress and the introduction of new plants proceeds with continued plant exploration which has been so generously encouraged by the Royal Horticultural Society.

The number of accessions is so great from these Himalayan and Chinese areas that I must, perforce, limit my survey within the time at my disposal. I must, therefore, exclude all woody plants as they could

provide material enough for several talks. I shall confine my remarks entirely to herbaceous subjects of which I have had considerable experience. It may be that I shall omit plants which others consider worthy of mention and, though I may agree on the merits of the omitted plants, I can only repeat that time is the limiting factor to my remarks.

I shall now review the plants which I propose to mention in alphabetical order, or nearly so.

The wide distribution of *Anemone obtusiloba* was greatly extended when this particular form (*f. patula*) was collected in Western Burma. Early attempts to introduce this plant by seed failed and not until 1913, when live plants were brought home, was *Anemone obtusiloba f. patula* successfully established in our gardens. To meet with any success the seed must be sown immediately it is harvested and even then the percentage of germination is very low. The Blue Buttercup, though varying in the wild, remains fairly constant in cultivation and is a plant which can lose much of its charm by being too well cared for, as then it tends to become rather coarse. It is a typical meadow plant occurring in thousands in S.E. Tibet. A place should also be found, if possible, for *Anemone demissa*, which is so attractive both in foliage and in flower, particularly the form which shows a trace of colour in the satin-white flowers. (Fig. 120.) Another *Anemone* that has added interest to our gardens is *Anemone rupicola*—the large cream-white flowers with brush of yellow stamens are always attractive. This easily grown plant, given a reasonably cool root run, will go on from strength to strength.

Adonis brevistyla (Fig. 119) is a near relative of *Anemone* although, in the genus, it is not so familiar as the European yellow-flowered *Adonis vernalis*. The Chinese species is, however, equally attractive with its finely cut, shining, fern-like foliage which makes so beautiful a foil to the pale lilac flowers which all too soon fade to white—the dark blue reverse of the flower adds further to its charm. It enjoys partial shade in a well-drained position.

Paraquilegia anemonoides though known for a very long time still remains a very rare plant due largely to difficulty in cultivation. Looked on as an ideal alpine house plant, it deserves every possible care to bring about its successful cultivation. It is a true alpine cliff plant and one which enjoys a sharp scree mixture. Both plants and seed have been sent home by LUDLOW and SHERRIFF and every effort should be made to establish and increase this lovely species. The finely cut glaucous foliage makes a delightful foil to the delicate pale blue flowers. Before leaving this family mention should be made of the dwarf *Trollius* species which include *T. acaulis*, *T. pumilus* and *T. vaginatus*, all of which enjoy a cool, dampish position and part shade where the golden-yellow flowers may be admired to full advantage.

The popularity which the genus *Androsace* enjoys to-day is, perhaps, largely due to that beautiful free-flowering species *Androsace primuloides* and its various forms from the Himalaya. *A. sempervivoides*, is often found growing in association with the better-known *A. primuloides*. From the numerous neat rosettes rise the short stalks carrying the freely produced pink flowers; it increases readily by means of runners which may be planted in full sun in a well-drained position. Also in the

Chamaejasme Section, and from this area, are the large rosette types such as *Androsace Aizoon*, *A. strigillosa*, *A. foliosa* and *A. spinulifera*. One which, it may be hoped, will add further charm to the alpine house is the neat-growing rosy-purple flowered *Androsace Selago* from Sikkim and neighbouring Tibet—HOOKER described it as “a singular and beautiful plant.” All *Androsaces* benefit from protection by glass from the winter’s rain, so adding greatly to their life and general Spring appearance.

Turning now to the dwarf Asters from this area, there are several useful additions of which *Aster Forrestii* is one of the most outstanding, and, like the others, it is easily grown and increased by division. There is an imposing list of recent introductions—*Aster Bietii*, *A. diplostephioides*, *A. likiangensis*, *A. Purdomii*, etc., give some idea of the wide range we have to choose from. All are well suited to our gardens. Asters flower at a time when the peak of the rock garden flowering season is passed and they add their welcome touch of blue colour when it is most needed. They are very accommodating and there should be no difficulty in establishing them.

From past experience it is with some hesitation that I mention *Allium* and yet, the Himalayan region has provided a number of fine garden plants. All are easily grown and require a minimum of diet and attention to do well. *Allium Beesianum* is outstanding amongst them, as the pale blue flowers appear during August–September but, whether it be the blue-flowered *A. cyaneum* or *A. sikkimense*, or the pink-flowered *A. Farreri* and *A. Mairei*, all are equally attractive. *A. amabile* is one which should receive more attention, as its dwarf habit and rich maroon-coloured flowers combine to make a really good plant.

Compared with the wealth of material from the European area, *Campanula* is rather poorly represented in the Himalaya, and, of the two species worthy of cultivation, both are best treated as annuals. This habit very often seals the fate of many good plants in these days of time and labour difficulties, but, a well-grown specimen of either *Campanula argyrotricha* or *C. cashmiriana*, justifies the little time and care taken. Here it is convenient to include that close ally *Adenophora* and, of the species sent home, *A. coelestis* is certainly the one best suited for the rock garden. If treated as a *Campanula*, the 12–16-inch flower stalks carry extra large bell-shaped flowers which are of a rich blue colour. It is a good perennial and is readily increased by seed. In the *Campanulaceae*, the most outstanding introductions have been in the genera *Codonopsis* and *Cyananthus*. Several first-class rock plants amenable to cultivation in this country have been introduced during the last fifty years. It is a pity, of course, that the lovely flowers of many *Codonopsis* have such a disagreeable odour, but, fortunately, there are exceptions to this malodorous habit. *Codonopsis dicentrifolia* is one such exception and happens to be one of the most handsome members of the genus. It was amongst the many good plants sent home as seed from Nepal in 1929, and, though it has been rather slow to gain popularity in our gardens, it is reassuring to report that it still survives despite the many severe winters since planting in 1931. In nature this plant is found where it enjoys abundance of moisture during the growing season, quite

the reverse from the conditions demanded to maintain it in cultivation. In this country, it should be firmly planted on a well-drained ledge at eye-level—a point to bear in mind in the placing of all *Codonopsis*—so that the beautiful inner markings of the flowers may be appreciated. The dark blue flowers of *C. dicentrifolia* are gracefully suspended on mahogany-coloured wire-like stems. Attention should also be drawn to *C. mollis*, another new species introduced by LUDLOW and SHERRIFF in 1937. The long narrow pale blue flowers of this species are very attractive and unusual in the genus. This plant, growing out of doors at Edinburgh, seemed well established until the severe winter of 1939–40 killed it. The plant's requirements are now known much better, and it is pleasing to record that it is once again flourishing in several gardens. Amongst the other blue-bell shaped flowers are *Codonopsis Bulleyana*, *C. clematidea*, *C. nervosa*, *C. ovata* and also the chequered-flowered *C. Meleagris*. All are well worth a place in the rock garden. Apart from these mentioned, there are the climbing Periwinkle-flowered types which include *C. vinciflora*, *C. convolvulacea* and its variety *Forrestii* which was so beautifully shown by our President last year. *C. vinciflora* is the hardier species and, given a well-drained position where it can scramble over a neighbouring dwarf shrub, the rich blue flowers will be shown to full advantage.

The genus *Cyananthus* provides some of the most attractive and useful plants in the rock garden. The strong growing *C. lobatus* and its more refined counterpart *C. lobatus* var. *Farreri* are both good plants and not particularly difficult in cultivation. When one recalls such names as *C. Delavayi*, *C. incanus* var. *leiocalyx*, *C. longiflorus*, *C. pedunculatus* var. *crenatus* or *C. Wardii*, we are reminded of former glories which, it is to be hoped, may come again and enable us to profit from our earlier failures. The species which remain in our gardens include *C. microphyllus*, which was sent home as seed in 1934 from the Kumaon Himalaya under the name *C. integer*. Since then it has been widely cultivated and is now flourishing in many gardens where its long trailing stems carry the rich violet-blue terminal flowers. Given the moisture it requires during the growing season and free of excessive wet when at rest it should give little trouble. One of more recent introduction is *C. Sherriffii* which, because of its woolly young shoots, is more intolerant of moisture. The erect powder-blue flowers are set on stems which appear somewhat unusual compared with the silvery white shoots forming the central rosette. In its native Tibet it grows in profusion on open hill-slopes.

Amongst the *Cremanthodiums* are several first-class rock garden plants but all are, unfortunately, difficult to acclimatize. To appreciate their full beauty they should be placed above eye level, particularly the fine yellow-flowered *C. reniforme* which, like most of them, tends to hang its head. Of more recent introduction to our gardens is one *C. palmatum* subsp. *rhodocephalum* which resembles a giant *Soldanella* in the way in which the ray florets hang. The dark green foliage is over-topped with the pendulous flowers—pinkish in colour—although an occasional white may appear. These plants enjoy a good rich soil with sufficient body to maintain moisture and provide a cool root run.

We already enjoy much satisfaction in the growing of several beautiful American Slipper Orchids and any addition to their number is most welcome. Those untiring plant hunters who have become known in the horticultural world as "L. & S." have put the beautiful *Cypripedium tibeticum* (Fig. 122) within our reach by a recent liberal sending of live plants by air. There appears to be some confusion in this Eastern set known as the *Macrantha* Group but, whatever the difficulties in their nomenclature, their beauty is unaffected.

Deinanthë coerulea, a rather unusual and seldom-seen ally of the Saxifrages, was discovered by E. H. WILSON in Hupeh, and, from seed sent home, was first seen in flower in 1909. The flowers, which measure $\frac{3}{4}$ inch across, are a delicate shade of pale lilac and are borne on stems 12-18 inches high. The plant appears reasonably hardy but should be given a shady position where it can enjoy cool and moist conditions. Shelter from winds will avoid damage or marking to the rather large delicate foliage.

We are inclined to regard Delphiniums as being best suited for the herbaceous border but some species require alpine treatment. Consider *Delphinium Brunonianum* under natural conditions, how neatly and compactly it grows; and also *D. Pylzowii*, that treasure from Tibet with deep purple flowers. *D. likiangense*, though taller, is another species deserving more attention, but make sure that you have the true plant as, all too often, a very inferior plant is grown under this name. One can also use *D. tatsienense* with effect as an occasional plant to provide that touch of real blue, which only a *Delphinium* can.

The Gesnerads from these parts show considerable range in colour and form and the genera *Ancyclostemon*, *Briggsia*, *Chirita*, *Didissandra*, *Oreocharis* or *Petrocosmea*, are all worthy of consideration. To do them full justice they must, I think, be treated as alpine house plants. There is little pleasure in seeing a plant struggling for existence out-of-doors when a little extra protection may make it a thing of beauty. To show their full charm plants of this type must not only flower unscathed but have the typical Gesnerad foliage unspoilt if their real garden value is to be revealed.

The species of *Dracocephalum*—The Dragon's Head—from this area show considerable range and the pinnate-leaved forms which include such plants as *D. caulophyllum*, *D. Forrestii*, *D. Isabellae* or *D. tanguticum* and the simple-leaved *D. bullatum*, *D. heterophyllum* or *D. speciosum*, are all well worth growing. *D. Isabellae* for ease of culture and beauty, should be one of our early choices as the deep purple-blue flowers set in the grey calyces are always so fascinating. Of the simple-leaved types one cannot but admire the neat prostrate-growing *D. bullatum* with the freely produced heads of intense blue flowers.

It is difficult to pay fitting tribute to the glorious genus *Gentiana* in a talk such as this as it contains so many lovely and useful garden plants. Those growers who are fortunate in having the right conditions for the successful growing of those plants can add considerable interest and colour to their gardens—particularly in the Autumn—a time when it is most needed. From the rock garden point of view, I do not think it too great a claim to make that *Gentiana sino-ornata* is one of the most

outstanding introductions of this century. Conditions required for the successful cultivation of these plants are good lime-free soil rich in humus, adequate moisture at the root, which can be overcome by watering and sufficient humidity which can only be partly overcome by shade planting—supplemented if possible by periodic overhead spraying. It may be observed in passing that atmospheric humidity is a most important factor in the successful acclimatization of these Asiatic species and proper seasonal provision of the right degree of humidity is an important key to success. Apart from the Spring-flowering gentians we can, from the many introductions this century, get a continuous supply of bloom to cover the entire Autumn period—from mid-July until the November frosts put an end to the floral display. Wherever possible, and for effect, the more massive the planting the more impressive the result. *G. sino-ornata* first flowered in 1912 and must be regarded as one of G. FORREST'S outstanding contributions to horticulture. Where space will permit, it should be supplemented with such fine species as *G. Farreri*, *G. gilvo-striata*, *G. hexaphylla*, *G. ornata* and *G. Veitchiorum* (Fig. 121), all of which are mat-forming types. Amongst the rosette-forming species *G. Kurroo* and *G. Waltonii* (Fig. 115) are outstanding, but *G. cachemirica* and *G. Loderi* are also well worth growing. These four species are particularly valuable in the South of England as they are able to withstand to a greater extent the frequent dry periods in the summer.

The present century has seen the introduction of some interesting Crane's Bills—one of the finest being *Geranium Farreri* with its large erect pale pink flowers and contrasting dark coloured stamens. Other species deserving mention are *G. napuligerum*, *G. Pylzovianum* and *G. collinum*, the latter, as was sent home with the 1929 collection from Nepal, is equal to our best coloured forms of *G. subcaulescens*.

Where the garden boasts a moist spot, or, better still, a running stream, a place should be found for at least a few dot plants of the Himalayan or Chinese *Iris*. The colour ranges from the dark purple *Iris chrysographes* and *I. Delavayi*, to the blue-lined *I. Bulleyana* and *I. nepalensis*, to the yellow-flowered *I. Forrestii* and *I. Wilsonii*. These species are all good garden plants, adding a grace and break of foliage to any mixed planting.

A number of *Lychnis* species have been grown with varying degrees of enthusiasm and though most have now passed out of cultivation it is difficult to recall any one name which we mourn. One recently introduced is *Lychnis Wardii* and the better coloured forms of this dwarf Bladder Campion are well worthy of more care and attention.

When we come to consider the Lily family we find some of the most thrilling discoveries of this century. First a word on the small *Hemerocallis* such as *H. Forrestii*, *H. nana* and *H. plicata*. In these we have real miniatures of the better-known types which dress so many of our mixed borders to-day. The difficulty is in providing the exact diet which will combine a proper balance between flower and foliage as so often the latter far outweighs the former. When one can induce this freeness of flower the varying shades of the yellow trumpets are indeed striking. Passing now to *Lilium* proper, we have in *Lilium regale* another of the outstanding introductions of the century. One can well imagine the

thrill it was to that great plant collector E. H. WILSON when he first saw this plant—not in hundreds but literally tens of thousands gracing the paths ahead of him in Western Szechuan. It is, I think, right to claim that *L. regale* has done more than any other Lily to stimulate the present-day wave of enthusiasm for this genus. It is not only a plant of great beauty but one, which, through its good temperament, can be readily cultivated by all plant lovers. This enthusiasm was furthered by the introduction of what we might describe as the *Lilium Davidi-Willmottiae* group and their now numerous hybrids. We must also remember FARRER's Marbled Martagon, *L. Duchartrei*, and the pink-flowered *L. lankongense* and *L. Wardii*. All these come within the scope of the rock garden. Closely allied to *Lilium* is the genus *Notholirion* which, so far, has four known species, ranging in colour from purple-crimson as in *N. campanulatum* to the rosy-lilac in *N. Thomsonianum*. The behaviour of the flowering bulb is unusual in that it dies after flowering, leaving behind a mass of miniature bulbils which can be grown on to flowering size in two to three years. All enjoy a position sheltered from draughts and biting winds in a well-drained soil rich in humus.

Coming now to that other Lily ally, *Nomocharis*, one can well imagine the reception *N. Mairei* and *N. pardanthina* received when they first flowered at Edinburgh from seed sent home by that great plant collector GEORGE FORREST. It matters little whether your choice lies in the growing of the pendulous-flowered types as in *N. aperta*, *N. Farreri*, *N. Mairei*, *N. pardanthina* or the upturned flowers of *N. saluenensis*, all are worthy of the care and attention they require. Due to the exactness they demand in growing conditions, great care should be taken in the choice of site and suitable soil. The essentials are a good sandy loam rich in humus which in summer provides a cool root run but in winter free of excessive moisture. The question of aspect and shade is one which can only be answered by the position and part of the country your garden is in.

The Poppy family, like some already mentioned, has added some wonderful additions to our garden particularly in *Meconopsis* which, of course, has grown so much in popularity in the present century and has provided many of our treasured rock and woodland-garden plants. Could any plant be more fitting to pay tribute to the long untiring service of CAPTAIN KINGDON-WARD to horticulture than *Meconopsis betonicifolia* (*M. Baileyi*)? When this plant first appeared in our gardens and on our show benches, a wave of appreciation spread through the country and its repeated appearance over many years in no way lessens this admiration. Can you recall those days in 1929 when we were more fully realizing the true value of the Nepal collection in which the genus *Meconopsis* had such wonderful additions, including *M. regia*, *M. Dhwojii*, *M. longipetiolata* and the claret-coloured *M. grandis*? The latter was rather disappointing but later became one of the parents of \times *M. Sheldonii*, one of the best perennial hybrids grown to-day. Are we on the threshold of another great step forward in the *Meconopsis* field with the rediscovery of the beautiful pink-flowered *M. Sherriiffii* in Bhutan? Those two great plant collectors MR. LUDLOW and MAJOR SHERRIFF have given us, through their recent sendings, every opportunity to establish

M. Sherriffii in our gardens from the plants sent home and the large quantity of seed which has been distributed. I very much hope to see this plant shown in this Hall for the consideration and admiration of us all. With all these reflections we must not overlook tried and trusted favourites such as FARRER's Harebell Poppy *M. quintuplinervia* which must find a home in most gardens. Where possible, a moist spot must be set aside for *M. grandis* or *M. simplicifolia* 'Bailey's form' and to see the full beauty of *M. aculeata* or *M. latifolia* no attempt should be made to cultivate but allow the plants to sow themselves. Those wishing to add further to their collection and who are prepared to give the necessary care and attention should attempt to grow the delicate *M. bella* (Fig. 116) or *M. Delavayi*. The aid of an alpine house is a great asset if those dwarf beauties are to be made happy and survive for any length of time.

We have every reason to hope that yet another member of this family will look on our climatic conditions kindly. *Corydalis cashmeriana* appears to be settling nicely in various gardens under largely varying conditions. Should this plant respond well to cultivation may we hope it retains the neat habit and intense colouring as in its native home.

Onosma Waddellii has so far been rather disappointing in cultivation in that it behaves as an annual. Despite this, it is unique in producing numerous clear blue flowers, and will do so from seed sown in early Spring, a point which must not be overlooked. Certain plants will carry into their second year, but, to be sure of keeping this treasure with us, an annual sowing of seed should be made to maintain succession.

The genus *Primula* must be regarded as producing some of the greatest assets to horticulture. A genus of this size showing the variation and form it does, can usually provide something to suit all tastes and conditions, although we know to our loss that our climate leaves much to be desired in the successful cultivation of so many of these treasures. Comparing notes to-day with what was recorded at the last *Primula* Conference many species then untested and regarded as of doubtful garden value are now common features in our plantings. But, on the debit side, just as many are as fleeting to-day as they were then. Taking an overall view, however, we certainly have much to report on the credit side and it is probably true to say that at no time have so many *Primula* species been in cultivation. The thirty odd sections into which the genus is divided by botanists also serve as a guide in their cultivation. Broadly speaking, all species within a section require similar treatment, so that if the grower knows to which section his unnamed plant or seed belongs he has a fairly safe guide to its cultural needs. I would urge the botanist and collector to identify the section to which distributed *Primula* seed belongs wherever possible, as this vital information may make all the difference in establishing new species in cultivation.

We are already familiar with the great part played by some of those sections in our gardens to-day, particularly the *Candelabra*, *Sikkimensis*, *Farinosae* and *Nivales*, etc. Let us turn our attention, then, to some of those sections which, due to recent introductions, are becoming more prominent in gardens. Outstanding amongst them are the

number of additions to the *Petiolares* section which, judging from their behaviour to date in cultivation, appear to have become well established. Their flowering has already become one of the anticipated joys in Spring. To the original member *P. Edgeworthii* (*P. Winteri*) have been added the blue-flowered *P. bhutanica* and *P. sonchifolia*, the pink-flowered *P. bracteosa*, *P. gracilipes* and *P. scapigera* and the yellow-flowered *P. aureata*, all of which have already proved themselves good garden plants. It would be pleasant to make a similar report on the *Soldanelloideae* section, for it is here we find some of the treasures of this large genus, but, alas, though advancement has been made, we are still far from complete. When we can enjoy the full beauty of the white *P. eburnea*, *P. Reidii*, *P. Wigramiana*, the pale violet *P. Sherriffae* and the deep blue *P. Wollastonii*, we shall have reason to feel proud of our achievement, but meantime we can enjoy the better behaved *P. nutans*. One could recall many such examples in other sections, but suffice it to say that with the experience gained from the material sent home and the speed up of travel, the future holds better prospects of further lasting additions.

Allied to *Primula* is the genus *Omphalogramma*, of which there are now some thirteen known species. The outstanding and certainly the best-behaved in cultivation is *O. vincaeflora* which first flowered in 1908 from seed sent home by GEORGE FORREST. The large, irregular, indigo-blue flowers are borne on stout stems from 12–16 inches high. *O. Farreri* is, I fear, no longer in cultivation, but *O. elegans*, *O. Elwesiana* and *O. Souliei* still remain in very limited numbers. Yet another species, *O. brachysiphon* (Fig. 117), has been sent home by LUDLOW and SHERRIFF from S.E. Tibet and it is to be hoped that it will take kindly to our conditions. It is one of the smaller members of the genus and the regular shaped flowers are of a rich deep-crimson. The successful cultivation of *Omphalogramma* may be compared with that of the *Nivales* *Primulas* all of which enjoy a deep rich soil and cool rooting conditions. Akin to *Omphalogramma* is the monotypic genus *Bryocarpum*. The sole species *B. himalaicum* should be treated like *Omphalogramma* if we are going to make it forget the clear air and humid atmosphere it longs for in common with so many of these Himalayan and Chinese treasures. The pendulous yellow flowers with their long narrow lobes are very characteristic of the genus *Bryocarpum*.

Amongst the *Polygonums* we find a few plants of garden value, and outstanding amongst them is *P. vaccinifolium*, which forms a rich carpet of glossy green leaves and from August onwards produces drifts of 4–6-inch spikes of rose-pink flowers. *P. Griffithii* is another plant deserving of wider cultivation as the rich-coloured foliage and deep-crimson flowers make it a most outstanding plant indeed; the same may be said of *P. sphaerostachyum*.

The genus *Roscoea* includes one or two desirable species which enjoy a deep well-drained soil in full light. There are now a number of species well established in cultivation, but the two outstanding are *R. Humeana*, with large magenta-coloured flowers which appear before the leaves, and *R. cauleoides*, though taller, the individual flowers are much smaller but of a good clear yellow. Mention must be made of the

variety 'August Beauty,' which is an Autumn flowering form of *R. cauleoides*.

The number of Saxifrages from the European area far outnumber those in our gardens which have come from the Himalaya and S.W. China, but nevertheless the long-known *S. lilacina*, from the Western Himalaya, can still command respect in any choice collection. Of recent introduction we have *S. pasumensis* and *S. umbellata*, two species which show great promise, as the neat rosettes and the orange-yellow flowers make them plants of interest and beauty throughout the year. For a moist position one should also bear in mind *S. diversifolia* and *S. cardiophylla*, both of which produce large yellow flowers on stalks 6-8 inches high.

In the genus *Sedum* I shall select only three species for comment. One of the outstanding members is *S. Hobsonii*, with bronze-coloured foliage from which rise the 6-inch trailing flower stems carrying their numerous heads of pink flowers. The mat-forming *S. primuloides* is already well known but *S. trifidum* is a plant deserving wider recognition, as the bright red heads of flower appear in Autumn making a welcome addition to our Autumn flowers.

Finally, we come to the rather variable *Thalictrum Chelidonii*, but it is to the dwarf form I wish to draw attention. From the typical fern-like foliage rise the short branched flower stalks carrying numerous delicate lilac flowers enhanced by pale yellow stamens, the individual flower measuring almost 1 inch across. Though they enjoy a sunny position in a well-drained soil; they like some ground shade to give coolness at the root.

I have now completed my somewhat sketchy survey of the rock garden plants from S.E. Asia with which I have been acquainted. There is no doubt, if plant exploration is allowed to continue on the Eastern Himalaya and neighbouring areas of Tibet, Assam, Upper Burma and South Western China, that there are many riches still in store for the rock garden. Let us hope that conditions will allow the intrepid plant hunters to continue their quest for plants to adorn our gardens.

I would like to express my thanks to MAJOR G. SHERRIFF and DR. G. TAYLOR for the use of their photographs taken of plants growing in Tibet.

BUD BLAST ON RHODENDRONS AND AZALEAS

A NOTE FROM THE R.H.S. GARDENS, WISLEY

FOR some time a disease affecting the buds of Rhododendrons has been known in this country, under the name of "Bud Blast," but until recently it has not assumed serious proportions. In the last few years, however, and especially during 1949 and 1950, it has spread considerably, mainly in south-east England. Pressure of other work has unfortunately prevented a full investigation of the disease at Wisley, although it is hoped as soon as possible to extend the preliminary work

already done. In the meantime it may be useful to summarize the measures that have been reported as successfully controlling the same, or a very similar, disease on Azalea buds in America, known as "Bud and Stem Blight of Azaleas" and caused by the fungus *Sporocybe Azaleae*. It should be emphasized that, as far as we are aware, these measures have been applied in the States *only to deciduous Azaleas*, whereas, in Britain, Bud Blast is, so far, much commoner on evergreen Rhododendrons which may not prove so suitable for the treatments recommended.

The American control measures were worked out by W. H. DAVIS and published by him in *Phytopath*, Vol. 24, 1939, p. 157. They may be summarized as follows:—

Three types of control treatment were investigated, viz. pruning, dusting and spraying.

1. PRUNING

All the diseased buds were pruned from highly infected plants of *Rhododendron canescens* during late autumn and early spring for two successive years. In addition during each summer month all stems with diseased buds were pruned back at least one inch and burned. Other diseased plants were kept untouched as controls. After four years all but one of the control plants were removed owing to their necrotic condition but the plants which had received the pruning treatment were healthy. This pruning and destroying infected buds had given successful control of the trouble in the City Park at Rochester, New York, since 1933.

2. DUSTING

Copper-lime dust was applied with a hand duster to *all* buds before the flower buds opened in the spring with the object of killing spores on the exterior of old infected buds. By dusting every two weeks the surface of the buds was constantly covered with the dust during the growing weather in spring until blossoming time. After blossoming the vegetative buds were dusted until they opened. On the matured leaves and newly formed buds the dust was applied monthly until leaf-fall when biweekly dusting was resumed until freezing weather commenced. Nearby control plants were not dusted. This copper-lime dust treatment decreased the infection during the two years it was applied. The dusted plants showed less than 8 per cent. infected buds while the ones not dusted bore 30 per cent.

3. SPRAYING

A liquid Bordeaux (5-5-50) was applied to infected buds. The application followed the lines as described for dusting, i.e. dormant and pre-blossoming, after blossoming, then monthly until leaf-drop and then the buds and stems kept constantly covered with spray until freezing weather appeared. This spray controlled the fungus better than pruning and dusting but the extra inconvenience in its application and the resulting appearance of the plants militated against its use by florists and horticulturists.

The above account ends with the statement that pruning and destruction of diseased twigs and buds, dusting with copper-lime dust and

spraying with Bordeaux mixture will control the fungus on Azaleas. It is also stated that 90 per cent. of the control is obtained by the "fall" or autumn applications of the fungicides because infection occurs during this period.

It must be remembered that the spraying with 5-5-50 Bordeaux mixture concerns the treatment of Azaleas, and for evergreen Rhododendrons the weaker strength of 2-2-50 Bordeaux is recommended. There is no record in the account of the American work of any ill-effects on the Azaleas treated due to the lime content of either the copper-lime dust or the Bordeaux mixture spray.

It is suggested that those growing Rhododendrons or Azaleas affected with Bud Blast should try one or more of these control measures, so far as they are practicable under their own particular conditions, and should send a report on the result to The Director, The Royal Horticultural Society's Gardens, Wisley, Ripley, Woking, Surrey. The Director would also be glad to receive specimens of twigs bearing affected buds from as many localities as possible so as to gain more information on the distribution and spread of the disease. Such twigs, in addition to buds, should bear two or three leaves and should be labelled with the name of the Rhododendron where known.

Buds affected with Bud Blast may show as early as September when some of the scales show a brown discoloration which rapidly involves the whole bud. The colour may turn from brown to a silvery grey, but the outstanding feature is the appearance on the outside of the affected bud of small black hair-like stalks about one millimetre long and bearing at their tips a head or knob. These stalk-like structures are the fruiting bodies (coremia) of a fungus, *Sporocybe*, and the head of each is composed of a small mass of spores. The coremia are so numerous that infected buds very often look black in colour.

Buds damaged by frost are superficially similar to those affected with Bud Blast as they turn a light brown colour, but they are easily broken off (while those infected with Bud Blast remain firm) and fruiting bodies are absent. It must be remembered, however, that the fungus may quite well attack frosted buds after they have been killed by low temperatures. (Fig. 130.)

NOTES ON THE ROSA SPECIES AND HYBRIDS AT WISLEY

Rona Hurst

IN 1934 much of C. C. HURST's large collection of *Rosa* species and hybrids was transferred from Cambridge to Wisley and planted out in beds to show the different chromosomal types present in the genus. These range from diploids with 7 pairs of chromosomes to regular polyploids with 14, 21, or 28 pairs and irregular polyploids with 7 or 14 pairs and 7, 14, 21 or 28 unpaired chromosomes.

This collection together with the original collection, will be found in Howard's Field.

This genus has always been an extraordinarily difficult one, and although a number of workers have spent a great part of their lives in attempting to unravel the different problems involved, it was not until the chromosomes were examined that many of the more difficult ones were solved. This work, however, revealed many even deeper problems.

HURST started his long series of cytological and genetical experiments on the genus after the 1914-18 war, working at Cambridge but travelling about to see material growing wild or in the various collections in Britain, France, Switzerland and Italy, gradually adding to his own species collection, started early in the century at Burbage, and making genetical crosses to track out problems of evolution. Before the majority of the latter could arrive at a useful stage the financial crash of 1929-30 not only crippled HURST's financial position but the general insolvency of the country stopped various grants which had been given for the work. SIR DANIEL HALL, realizing its great interest, arranged that the more important part of the collection should be given a home at Wisley until happier times might provide the opportunity to work with them once more, but before this could arise the 1939 war was upon us and HURST himself died in 1947.

However, whatever its difficulties may be as a genus, *Rosa* has the great facility of being able to live on almost indefinitely with practically no care or attention and, when the time again comes round when this is possible, skilful pruning and care will soon bring them to full recovery. This has now taken place in the Wisley collection, thanks to the hard work and enthusiasm of MR. GORDON ROWLEY, the keeper of the National Rose Collection now being assembled by DR. DARLINGTON at the new John Innes Gardens at Bayfordbury. Although during the war labels had deteriorated or been lost there were happily copious plans so that it has been possible to identify the plants correctly and to get them back into good condition. The original Wisley collection, together with the Hurst collection, now makes up one of the finest assemblies of *Rosa* species in the world. Obviously, after so many years, the genetic part of the collection, which was often merely in early seedling condition when moved, now consists of strong, fully grown bushes, and there is a mine of material for future work all ready and waiting.

Although the original idea of the hybridizations was usually to solve evolutionary problems, several specimens of great horticultural interest have arisen. Many of the hybrids have an extremely ornamental habit of growth and foliage and charming flowers. Being hybrids some of them are naturally sterile but others of nearer parentage are wholly or partially fertile and are useful again in the autumn garden for their fruits. Planted as single specimens in grass in a semi-wild state or on a lawn, they are very striking and in June-July will give a magnificent display of bloom lasting for some weeks and covering strong, well-grown bushes running up to 10 feet or more in the largest forms. Heterosis is usually very evident in *Rosa* hybrids. They are equally effective as a sheltering background in borders where they can be given sufficient room, and there are smaller ones, such as the *altaica* hybrids, for more cramped positions.

One of the most spectacular was the hybrid between a very good form of the American *R. nutkana* and the garden Rose 'Red Letter Day'

which produced a tall summer-flowering bush covered with large single red flowers of great beauty. Under the name of 'Cantab' this Rose won the Cory Cup at the R.H.S. in 1939, but owing to the war it was not possible to follow up the original idea of introducing the strong, sturdy growth of *nuthkana* into the garden Roses and by future hybridizations to produce perpetual flowering forms and a new race which would, under the modern swing towards bush culture as a labour saving device, be a most valuable addition to our gardens. The original bush, together with some of the other hybrids, is in the Botanic Garden at Cambridge but it is still suffering from war conditions. However, there are others raised from it by buds or cuttings and it is now hoped to follow it up by further breeding.

There are many striking hybrids of *R. Moyesii*, especially with *pendulina* and *setipoda*. None of them comes up to COLONEL STERN'S magnificent *highdownensis* in fruiting value but the flowers are in many cases extremely beautiful, especially in conjunction with graceful growth and foliage. The type colour of *Moyesii* is usually lost but there are some unusual shades of rich pink and the petals are of good texture.

Obviously it is not possible to reproduce these hybrids from seed though many interesting secondary forms arise in this way, but fortunately in *Rosa*, with its easy budding propagation and indefinitely prolonged life, this does not matter. As a matter of fact, in an ordinary garden they are often more convenient on a stock, as many of them are inclined to run and can become a nuisance in a confined space.

There are many interesting types among the species themselves, especially from the point of view of fruits for autumn colour in the garden. The old favourite *R. pomifera*—the Apple Rose of old gardens—is always worth growing for its fruits as well as for its greyish foliage, and its relative, our own British *mollis*, makes compact little bushes covered with large red fruits. There are various allied species, too, which are equally ornamental, such as certain forms of *glutinosa*, which are normally only a few inches high, bearing very beautiful red fruits of considerable size. These would be ideal for providing late colour in a rock garden, especially in rather dry and difficult positions, for it apparently thrives under these conditions.

In fact there are a number of wild Roses not yet utilized in gardens which would produce invaluable late summer and autumn colour by their fruits, and in some cases by their autumn tints, following on a summer flowering season and a quite ornamental intermediate period while the fruits are maturing, capped by their picturesque sepals. In southern Britain we admire the wild Rose fruits in the hedgerows but jib at their ramping growth. In the northern counties and in Scotland, however, there are a number of dwarf-growing species which cover themselves with fruits, giving most brilliant patches of colour. A few of these are growing at Wisley, but a new collection of them from the wild is now being grown on at Bayfordbury. An examination of the *Rosa* species and hybrids in these gardens and at Kew should provide many new ideas, especially for those who are taking up bush culture or who have difficult corners and semi-wild positions which need interesting occupants.

BUDDLEIA ALTERNIFOLIA

F. Hanger

CURATOR R.H.S. GARDENS, WISLEY

THIS very distinct *Buddleia* was first described by MAXIMOWICZ in 1880, but did not arrive in this country until 1914 when it was introduced by FARRER who found it in Southern Kansu.

This absolutely hardy flowering shrub produces lilac-coloured blossoms in crowded clusters, in long racemes, from the nodes of the previous year's growth, therefore differing from *Buddleias* generally, which flower on the current year's wood. Should this plant need pruning, and in the majority of cases it is advisable, it should be done immediately after flowering, i.e. late June or very early in July; when the old flowering shoots can be cut back to the point where the new young growths are already an inch or so long.

Buddleia alternifolia is not in the least fastidious regarding soils and with its small-leaved weeping-willow-like habit, it shows to the best advantage when isolated and given plenty of room. It is especially attractive when grown as a bush and allowed to overhang water, here, its pendulous sprays have the added advantage of reflection in nature's mirror.

Although FARRER mentioned in his field notes that *Buddleia alternifolia* made, in some cases, a small trunked tree, it is seldom encountered growing other than in bush form.

The two small standard trees growing near the annual border at Wisley (Fig. 114) have responded well to yearly pruning during the past four years, and have become a source of attraction during the month of June. Planted in small round beds surrounded with grass, the largest has become 15 feet high and 12 feet in diameter on a clean 5-foot stem with branches hanging and sweeping the ground, while the second tree is approximately 12 feet by 9 feet.

Propagation is easily obtained by seeds, layering or cuttings, the latter root readily if taken when soft during early July and inserted in a close propagating frame with or without bottom heat.

Young plants intended as standards must be trained to a stake and kept disbudded until the desired height of stem is reached, when the head may then be allowed to develop. *Buddleia alternifolia* is a strong grower when young but, to attain a grown specimen in standard form, it must receive ample support to enable the trunk to uphold the rapidly expanding head.

NOTES FROM FELLOWS

Camellias for Roadside Planting

MR. COLLINGWOOD INGRAM's observations on *Camellias* (see p. 158, April JOURNAL, 1950) planted in full sun in such hot places as Vigo are certainly surprising until one carefully notes the conditions under which they are growing. I have seen similar instances in the South of Portugal, where large trees of *Camellia japonica* and also of *Camellia reticulata* are grown in full sun and in perfect health.

It is not the leaves, but the roots of Camellias which resent heat and drought, and I believe that it is now generally known that they can be well grown in a south aspect in England providing the young plants are heavily mulched. Later, as they grow and spread they produce their own shade and further mulching is no longer a necessity. MR. COLLINGWOOD INGRAM tells us that the roots of his Vigo Camellias were covered by concrete and that in itself explains their tolerance of the scorching sun.

May I also remind him that in his own Benenden garden he has three large Camellias growing in a sort of loggia, facing south, these shrubs do not even get overhead rain but they are the picture of health and each spring are heavily laden with flowers. Except for a small space where the trunks rise from the earth, the whole ground is entirely paved. Anyone who will trouble to lever up a piece of concrete or a paving stone will invariably find the underlying soil both moist and cool even in the driest of weathers.

MAURICE AMSLER

Hawkhurst, Kent.

SOME FAMOUS IRISH GARDENS

G. S. Thomas

PART I

MY first visit to Ireland was in 1937, when I visited Rowallane and two famous nurseries in Northern Ireland and also the Glasnevin Botanic Garden at Dublin. What I saw then whetted my appetite in no small way; I resolved to spend a longer time in that country so specially suited to the cultivation of the bulk of plants we know and grow over here, and the opportunity occurred to spend eighteen days there directly after Chelsea in 1949. Even had it not been at such a superlatively lovely time of year I should have felt my journey and visits were well rewarded; as it was, more than once did I stand spellbound with the beauty and brilliance of gardens in their full or growing splendour, and with the luxuriant green of the countryside.

Seeing plants and gardens and photographing them took up almost the entire time, very little remaining for the enjoyment of other matters; it was wholly a gardener's holiday. Some of the resulting photographs are reproduced in these pages, and the following notes record a few of the lovely views and fine plants that I saw. It must not be supposed that these notes are by any means complete, numerous plants must be omitted for want of space, but I take great pleasure in recording even a small part of the lasting enjoyment my visits gave me.

It must be borne in mind that I write from memory in Surrey, aided by my notebook and photographs and some details kindly furnished later in regard to heights, soils, etc., by the owners, and that many shrubs, which over here we should not dream of attempting in the open, in Ireland grow happily and luxuriantly. The influence of the Gulf Stream is greatly felt, and rainfall in most of the gardens is very heavy



Photo: G. S. Thomas

SOME FAMOUS IRISH GARDENS

FIG. 113. In the Walled Garden at Rowallane (Saintfield, Co. Down) *Meconopsis quintuplinervia* in foreground, foliage of *Keteleghoma* on right with *Al. betulaefolia* and *Azalea Darcasi* beyond. (See p. 237.)

FIG. 114. A Standard *Buddleia alternifolia* at Wisley in June. (See p. 235.)

Photo: N. K. G. et al.





SOME INTRODUCTIONS FROM THE HIMALAYA AND SW. CHINA

FIG. 115. *Gentiana Waltonsii*. (See p. 226)



FIG. 116. *Meconopsis bella*. (See p. 228.)



FIG. 117. *Omphalogramma brachysiphon*. (See p. 329)



FIG. 118 *Primula macrophylla*



FIG. 119 (above) *Adonis brevistyla* (See p. 222)

FIG. 120—*Anemone demissa* (See p. 222)



FIG. 121 -- *Gentiana Vetchionum*
(See p. 226)



FIG. 122 -- *Cypripedium tibeticum*
(See p. 225)



Photos, G. S. Thomas

SOME FAMOUS IRISH GARDENS

FIG. 123---Castlewellan (Newcastle, Co. Down), *Fraxinus excelsior pendula*, showing the value of a tall stem. *Cordyline indivisa* and Azaleas (See p. 240)



FIG. 114 Rowallan: the mown path to the Conifer collection with dwarf Azaleas and Rhododendrons on the rocky outcrop seen in the distance of Fig. 125. (See p. 238)



FIG. 115 Rowallan: looking west from the inner enclosure in the landscape Rhododendron planting. (See p. 238)



FIG. 126— Mount Usher. Looking downstream with *Acer pseudoplatanus* on lawn and 25 ft. high *Abelia triflora* showing against dark background in middle of picture (See p. 246)



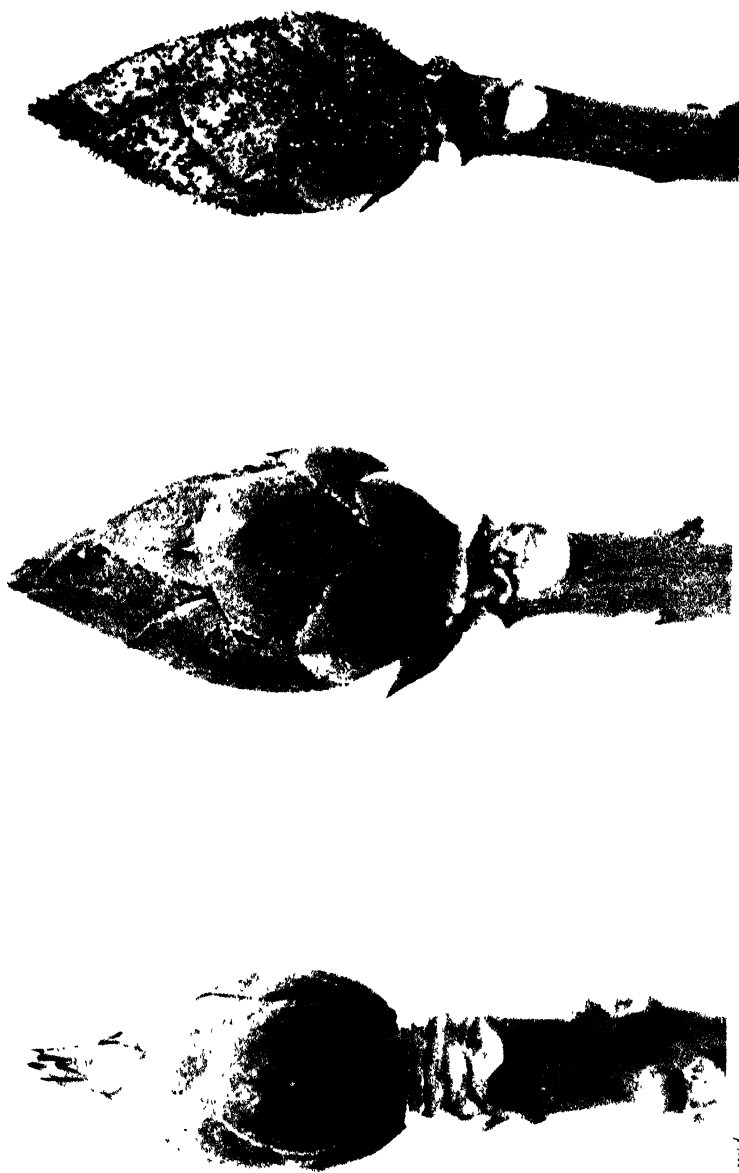
FIG. 127 --Mount Usher. *Cornus Kousa* surrounded by *Cercidiphyllum*, *Davidia* and *Pinus Montezumae* (See p. 246)



FIG. 128. Mount Stewart. *Hostaria multicaulis* in Japanese vase and South Front of house. Note grotto on double pillars and *Cupressus macrocarpa* clipped into arches on left. (See p. 242)



FIG. 129. Powerscourt. Standard Portuguese Laurels and columns of *Cupressus*. Low clipped mounds of Yews, edged with Box and surrounded by narrow rim of bedding plants. (See p. 243)



Photo, N. K. Gould

RHODODENDRON BUD-BLAST

FIG. 130—*Left*. Rhododendron bud damaged by frost. *Center*. Bud showing early stage of bud-blast. *Right*. Later stage of bud-blast showing the fungus tracheiticans (Cercaria) as little black stalks scattered over the bud. (See pp. 230-232.)

compared with Surrey, being about 30 to 45 inches annually. Frost is negligible in most winters and although an occasional disastrous winter does great harm, in many gardens the average frost in winter does not exceed 10°.

In the company of my old friend MR. THOMAS BLYTHE, a connoisseur of good plants and a skilled gardener near Lisburn, I arrived at the entrance to Rowallane at Saintfield, Co. Down. Memories of my earlier visit were with me as we walked slowly up the long winding drive, beset with interesting plants and an occasional cairn of rounded boulders. MR. H. ARMYTAGE MOORE met us at the house, which commands a good view of undulating turf, the contours of which are accentuated by careful plantings of Rhododendrons and Azaleas and offset by some fine Conifers notably *Abies magnifica*, 60 feet high, and the dark green of *Pinus radiata* (*P. insignis*), *Abies Pindrow* and *Picea spinulosa* (*morindoides*).

The walled garden nearby was a source of infinite delight. It is of simple design, but contains in one corner a Celtic cross design in paving in the midst of which is planted *Viburnum tomentosum* 'Rowallane variety,' a compact type with small leaves and flowers of creamy blush—a form raised from seed of WILSON'S collecting over forty years ago. On the wall at the back, by looking closely amongst the foliage, one could see the pearly bells of *Clematoclethra lasioclada*. Following round the gently curved path, along whose sides *Primula helodoxa* and Lupins had seeded freely, we passed under a *Magnolia Watsonii* 20 feet high and wide and several of the *Wilsonii* and *sinensis* clan, all giving us scent of the most delicious quality. I was to see many of these Magnolias subsequently, but I never see them without feeling that their flowering time is one of the supreme moments of the year. Their waxen white saucer-flowers have a purity unequalled by other flowers. *M. Dawsoniana* and *Veitchii* were also noted.

Passing clump after clump of *Lilium giganteum yunnanense*, which was a superb sight on my visit before the war, we came to a cool corner which, backed by the creamy variegated form of *Azara microphylla*, was given to the glorious blue *Meconopsis grandis*. These were just at their best and put extensive clumps of *betonicifolia* quite in the shade, and were direct descendants of the fine forms grown by MR. T. HAY at Hyde Park before the war. Other splendid plants found in these borders are *Rodgersia pinnata superba*, *Ranunculus Lyallii*, the Rowallane Hypericum, *Meconopsis quintuplinervia*, *Anemonopsis macrophylla*, and an enormous clump of *Kirengeshoma palmata* which, MR. MOORE told us, when in flower in later summer, would measure 5 feet in height and 10 feet across. (Fig. 113.) Nearby *Meconopsis betonicifolia* were very attractively placed next to the Ghent Azalea 'Daviesii.' At this point we had converged on to an old brick wall with a picturesque archway; looking back along another path, under Japanese Cherries which are spread beneath with Peonies and other good stalwart herbaceous plants, we had a pleasing view of the house, through the gate by which we had entered this garden. Aubrietias and other lowly plants flow on to the path in the sunny areas.

Going through the archway, we came to another cool corner with more *Meconopsis*, *Primula* 'Rowallane Rose' and *Rhododendron* 'Lady

Chamberlain.' This underplanting of "smaller fry" was contrasted by *Paulownia tomentosa* and *Davidia involucrata*, and a truly immense *Hydrangea Sargentiana*, some 12 feet wide and 6 feet high. Proving at once how much the climate suits it, this noble species, with its large, velvety, dark green leaves and wide heads of blue flowers, has actually seeded itself into the brick wall. Nearby is the original *Chaenomeles Lagenaria* 'Rowallane Seedling' a vivid vermilion-red large-flowered form of procumbent habit; a 10 feet plant of the splendid Trewithen form of *Osmanthus Delavayi*, and *Myrtus Lechleriana*, still taller, whose flowers are very conspicuous.

Leaving this part of the garden, where good plants are grown well, and, I think I might say, are grown for themselves more than for the view they create, we looked in at a small walled enclosure set aside for tiny alpine Rhododendrons and other shrubs and rare alpine plants; on the raised borders these miniatures can be carefully tended and admired. We then left this more formal area, went through the trees and eventually came upon as lovely a view as could be imagined. (Figs. 124 and 125.)

On an undulating meadow with scanty soil overlaying whinstone rock, which peeps out of the short turf here and there, MR. MOORE has created a very satisfying picture, varying with every step. The landscape is broken by a thin planting of Cherries, Magnolias, Davidias and other flowering trees, mostly standing in the turf—which we could see had only recently been bright with Daffodils—with broad masses of Rhododendrons of all kinds skilfully following or breaking the contours as the views demand. They range from kinds such as 'Cynthia' and 'fastuosum flore pleno,' through the whole range of sun-loving species like the triflorums and Azaleas; in addition, there are many plantings of the smaller species of Rhododendrons and Japanese Azaleas demonstrating their supreme value for permanent beauty and interest on suitable rocky sites. Most of these were fading, but the hardy hybrids made great splashes of colour and various late species such as a wine purple *R. ianthinum* were still in flower. This beautiful and varied planting melts into groups of old Scots Pines, Beeches and Oaks and away into the distance and the cloudscape, with the mountains of Cumberland dimly visible on the horizon. The concentration of colour and height is most carefully thought out and it is obvious that the area of several acres would be bright with bloom from early spring until midsummer, and again in the autumn. Mown grass paths conduct one to all the best views which are constantly reviewed and revised by MR. MOORE's discerning eye.

From this sunlit area we entered the group of greater trees, enclosed by an old stone sheep wall. Here a great suckering mass of *Philesia buxifolia* and its rare hybrid *Philageria Veitchii*, *Drimys colorata* with pink tinted leaves, *Vaccinium Delavayi* and other rarities are growing happily. Reigning supreme in a corner of its own, and placed high on a rocky promontory, Rhododendron 'Britannia' was in full bloom, the sun shining through its gorgeous scarlet trusses. On another slope *R. burmanicum*, a tender species, was just losing its yellow bells. A fine combination of a late flowering blush-white *R. yunnanense* and the handsome red 'Garnet' dominated a quiet scene where a little stream finds its

way between many boulders; over them wave fern fronds and the great green plate-like leaves of *Rodgersia tabularis*.

Another gate took us out into the sunlight again past clumps of hybrid Rhododendrons and up a slope where some unusual Conifers were to be found. *Pinus Armandii* and *Cupressus lusitanica glauca pendula*, the latter some 20 feet high and wide, were two fine specimens I noted, and farther along *Populus Maximowiczii* and *Wilsonii* were showing noble smooth trunks, their large leaves contrasting strongly with the native foliage.

I left Lisburn the following day and went to Newcastle, which so conveniently nestles between the Mourne Mountains and miles of hilly sand dunes, both of considerable interest to the plant lover. Inland is Castlewellan, the seat of the ANNESLEY family. I was fortunate with the weather again here and on a brilliant afternoon drove with MR. LESLIE SLINGER through the beautiful park up to the Castle. It was built in 1856, and stands on an eminence commanding a fine view, over the park and an extensive lake, to the mountains. The grey stone is contrasted by lawns and clipped golden Yews, but the actual garden, on light gravelly soil, lies behind, and we were shown round most kindly and ably by MR. GEORGE GRAHAM, the head gardener. First we went into the large walled kitchen garden. The whole of this area is on a decided slope to the south, divided into four rectangles by two crossing paths, and the top gate is guarded by two Eucalyptus trees, *E. urnigera* and *E. cordata*. The view takes the eye down the long sloping path, flanked by wide flower borders which were just beginning to come into their own, and backed by immaculate hedges. At the intersection of the paths is a large vase, standing on a raised bed covered with *Lithospermum prostratum*, *Celmisias*, and other rock garden plants. The two rectangles on the right are cultivated for vegetables and their dividing path has borders devoted to Dahlias; at intervals are Irish Yews, each carefully trimmed into a narrowly conical outline, very arresting in their stateliness, and splashed here and there with the scarlet of *Tropaeolum speciosum*. Behind these are hedges of *Drimys aromatica*, about 4 feet high, which were just in the flush of their young foliage, a rich bronze green. It is certainly an ideal hedging shrub where hardy.

Looking along this remarkable walk, back to the central vase, we had the striking picture of the white tiers of *Viburnum tomentosum Mariesii* against the tall forms of Conifers, blue, green and golden. Amongst them towers a fine specimen of *Pinus sylvestris aurea*, 43 feet high with a good crown, the hybrid *Cupressus Leylandii* 38 feet high (*C. Lawsoniana* × *C. macrocarpa*, a vigorous and elegant tree), *Libocedrus decurrens* and *chilensis*, *Pinus parviflora glauca*, *P. Montezumae Hartwegii*, and many others; *Drimys Winteri* in full flower (31 feet), *Myrtus Luma*, and *Pittosporums*. Two trees with beautiful bark were *Arbutus Menziesii*, 30 feet, and a young fastigate specimen of *Betula papyrifera*. These are all on the two rectangles on the left of the central walk.

Through the lower wrought iron gate is another formal vista culminating in a two-tiered fountain at the crossing of the paths, and surrounded by Rhododendrons and Japanese Maples. The whole is set amid some of the finest specimen Conifers it has been my good fortune

to see. Most of the planting in this garden was carried out by the FIFTH EARL ANNESLEY and it was presumably his desire to grow the Cypresses each with many stems. The resulting immense pyramidal thickets of Thujas or Cupressus are certainly impressive to a degree, though possibly dangerous in old age. The specimens include *Picea Breweriana*, 19 feet, *P. Smithiana*, *P. morrisonicola*; *Abies amabilis*, *concolor Watzekii*, *Georgei*; *Cephalotaxus drupacea*; *Arthrotaxis*; *Glyptostrobus heterophyllus*; *Dacrydium*, *Podocarpus*, etc.

Long cross-vistas and a curved walk around the enclosing walls bring to light the great variety of form and foliage in this collection. The contrast at one point of an exceptionally tall weeping Ash, the broad leaved *Cordyline indivisa*, and the feathery grace of *Juniperus recurva* was particularly noticeable. (Fig. 123.) At another point a pyramid of golden-green *Thuja plicata variegata (zebrina)* is placed next to *Acer palmatum atropurpureum*, 19 feet high and about 35 feet across. The top path has a formal decoration of clipped Portuguese Laurels on stems—a favourite embellishment of Irish gardens—and wide borders along the walls contain many sun-loving shrubs, such as *Hoherias*, *Cestrum*s, *Ceanothus*, *Corokia Cotoneaster*, *Leptospermum*s, *Nandinas*, *Feijoa*, and *Cornus capitata*. At the east end is a raised terrace, whence the eye can range from the depths of this plantation of noble Conifers in all their varying shapes and colours to the bold rounded top of Slieve Donard in the distance.

Outside this well-tended garden we entered the fringe of the woodland, recently greatly extended under MR. GERALD F. ANNESLEY'S care and interest. *Fuchsia excorticata* had reached the dimensions of a low tree, *Arbutus*, *Rhododendrons*, *Conifers* and shrubs of many kinds are allowed to grow freely. The Grande series of *Rhododendrons* was well represented especially by a 24 feet *R. Falconeri*, and good plants of *ficulacteum* and *sinogrande*, also *R. Thomsonii*. I should have liked to have spent longer there, as my memory gives by no means a clear image of its many interesting plants.

MR. SLINGER took me to two smaller gardens in Newcastle; the one belonging to MISS MACNAUGHTEN where *Gentiana sino-ornata* and various choice trees, shrubs and heather are thriving excellently. This and the next garden owe much to the view of the neighbouring Mourne Mountains across the valley, and both MISS MACNAUGHTEN and LT. COL. SMITH, are very keen to have only the best plants. In the garden of the latter I noted bushes of *Deutzia longifolia Veitchii* and *Kolkwitzia amabilis* in full flower, and admired the striking contrast of two low evergreens, *Viburnum Davidii* and *Cupressus nootkatensis nidiformis*, against the more erect or graceful outline of other shrubs and *Betula verrucosa dalecarlica*. From the lawn a broad gravel drive slopes away entering an avenue of Japanese Cherries; the resulting tunnel appears to lead to Slieve Donard and thus the superb landscape is cleverly brought into the garden. A hedge of rugosa Roses is well worth noting too, likewise an outcrop of rock some 120 feet long against a steep bank about 15 feet high where *Lithospermum prostratum* and its forms have naturalized themselves. The vivid sheets of blue dotted here and there with the pinkish stars of *Erigeron mucronatus* was one of the outstanding sights of my tour.

Our next visit, on Whit Saturday, was another memorable event, and we were again blessed with a brilliance that only June can give. Motoring round to Newtownards at the northern end of Strangford Lough we turned to come down the eastern shore, and entered the drive to Mount Stewart, the home of EDITH, MARCHIONESS OF LONDONDERRY. The garden is in an exceptionally favourable maritime position, sloping gently to the south, on good yet light soil overlying marl and gravel. The drive is overspread by Oaks, and is spaciouly planted with groups of Grande series Rhododendrons, and the greater hybrids of varying types, giving heavy contrast to the native vegetation. A very large specimen of *Erica arborea* is seeding itself, likewise *E. australis*. The house, built in the eighteenth century, stands in a clearing, as it were, of *Quercus Ilex* and other native trees which give added shelter to an already warm spot.

LORD BURY was our first kindly guide, and we entered the woodland where a fine taste in Rhododendrons was evident. Most species were over, but *R. Griersonianum* and its hybrids were showing colour, also *R. Elliottii*, in large groups of flaming red. Others include *R. Thomsonii*, *Aucklandii*, *decorum*, etc., and there is a healthy young specimen of *Cunninghamia sinensis*, 15 feet high. Leaving the chequered shade of the trees we came into the open where, on rising ground, stands the Mausoleum, approached by banks of Rose species; many tender trees and shrubs grow around its walls including *Olea fragrans*. Leading away from this is a wide grass slope backed by forestry Conifers on each side, and planted on broad and generous lines with a red-white-and-blue avenue, in commemoration of the Silver Jubilee of KING GEORGE V and QUEEN MARY. The colours are derived from Rhododendrons and Embotriums, Japanese Cherries, and Eucalyptus foliage and *Solanum crispum*. This unusual avenue takes one down to the lake. Around the shores we noted a careful placing of Davidia next to the coppery-mahogany foliage of *Acer platanoides Schwedleri*, surely very beautiful together in May. A host of rare trees and shrubs were encountered, but I chiefly remember coming suddenly upon *Weinmannia trichosperma*, in full flower about 25 feet high. The flowers are small, creamy white, and borne in more or less erect small spikes.

This was a most interesting tour, but the splendour of the formal prospect, after going through the house has left a more indelible picture on my mind. Here LADY LONDONDERRY joined us. The grey mansion is surrounded by a generous flagged terrace, from which steps lead down to the southern vista, framed by two immense Irish Yews, about 40 feet high and half as wide. Behind these tower lofty *Eucalyptus globulus*, grey leaved and with shaggy bark, backed by evergreen and other Oaks. These are around the rectangular lawn containing a design of colourful flower beds and the Yews; here were Delphiniums, Poppies, Peonies—both the herbaceous type and a big bush of an uncommon coppery red Tree Peony—Verbascums, the buff coloured single Rose 'Mrs. Oakley Fishèr,' and the Hybrid Musk Rose 'Penelope,' 7 feet high, giving colour through the season. This rectangle lies along the length of the house, with the main vista leading across its wide lawn, to more steps, and a pair of lofty pillars on each side, surmounted by griffins. Flanking the view

are Cordylines and Palms and forest trees. Further steps take one down to a small lawn and sunken pool, on the edge of which stands a stone urn containing a bush *Wistaria multijuga*; both plant and pot were curtained with blossom, weeping to the water. (Fig. 128.) The immediate end of the vista from the house rests on a green-roofed summer-house, on whose shady walls thrive *Lapagerias*, *Rhododendron rhabdotum* and *R. Nuttallii*. Beyond this the vista goes on, over an unseen road to an impressive avenue of *Rhododendron arboreum* forms, a scene of splendour earlier in the year, their towering shapes set some forward and some back against their background of trees. At the end of this we came first to the bathing house and sunken pool of sea water and then out to the very shore of the Lough itself, with the Mountains of Mourne away in the distance. And everywhere the plant-loving owner, with an exceptionally catholic taste, had chosen the right plant—*Fuchsia*, *Escallonia*, *Veronica*, *Olearia*, *Beschorneria*, *Yucca*, etc.

Returning, by way of the wooded flank of this great vista, where are growing Tree ferns and their more lowly types, *Daphnes*, *Camellias*, *Rhododendrons*, etc., to the terrace, I was struck by the richness of the balustrading, urns, vases and other ornaments, and was interested to hear that they had all been made to LADY LONDONDERRY'S design from continental patterns, a great tribute to her enterprise and the skill of local craftsmen. The walling is broken by steps and buttresses and the varied corners are given to *Camellia reticulata*, *Rhododendron fragrantissimum*, *Eupatorium Weinmannianum*, *Fremontias*, *Psoralea pinnata*, and other tender shrubs. On the house are *Magnolia grandiflora*, a tree-like *Lippia (Aloysia) citriodora* or "Lemon Verbena," Pomegranates and Banksian Roses, etc.

The view from the west end of the house is quite different and I felt myself fortunate indeed to have been there just when the early summer display was at its best. The main area of the square garden here is sunk to some 5 feet, surrounded by a retaining wall. One can walk across the lawn, or around it on top of the wall under arches, for the wall supports a continuous pergola all round the three sides away from the house. Behind the pergola is a hedge of *Cupressus macrocarpa*. The predominating colour on the pergola is soft light yellow from *Lonicera etrusca superba*, *Rosa odorata gigantea* (in full flower) and other Roses, also *Dendromecon rigidum*; these are offset by the lavender blue of *Solanum crispum autumnale*. The low walls support a similar colouring from Rose 'Mrs. Oakley Fisher' again, *Geranium ibericum*, *Calceolaria violacea*, and various Rosemaries.

Below all this are the four corner beds; they are outlined with a hedge of Sweet Bay, 3 feet high, in a broadly scalloped geometrical pattern, and a strong L-shaped planting in each corner of *Azalea coccinea speciosa* completes the picture. The splendour of this gorgeous colour with the blues of *Anchusa* and the purples and light yellows on wall and pergola was something to be seen and remembered always.

Beyond this sunk garden is a circular or octagonal garden surrounded by a tall hedge of the *Cupressus* again on the top of which have been clipped into shape the various heraldic badges of the family. In the centre, and forming the key-piece of the whole vista is an Irish harp

also carved in Cupressus. The eye rests eventually on the varied outline of plantings of trees and shrubs beyond various Eucryphias, Magnolias, Lomatias, Arbutus, *Quercus Ilex* and tall native trees.

I left Northern Ireland and some very kind friends on the Tuesday taking up new quarters in Dublin, and my first visit was to Powerscourt, a few miles south of the city in Co. Wicklow, whose upland scenery is a soft and lovely blend of hill and moor. On a morning of dazzling clarity I drove up the long wooded approach from the village and arrived at the rather forbidding north front. The contrast between this and the south front is almost unbelievable on a bright day. With the strong foundation, as it were, of the house and the long length of gravel walk, the garden slopes down terrace by terrace, for acres, in strictly formal style to lake and wood below, whence the eye travels up again to the soft hills crowned by the stately Sugar Loaf Mountain. The vast and imposing design is carried out mainly in stone, grass and Conifers, and is therefore of perennial beauty. On the garden side of the gravel walk is a line of stone urns and fine Italian statues, set at the edge of a wide strip of turf. Immediately opposite the house the steps lead down to a parterre of black and white cobbles, at each end of which curving flights of steps descend to a semicircular recess containing a pair of Italian bronze figures spouting water into a wide bowl and with a mural sundial in the pediment above. From here, flight after flight of steps, with the grass slopes curving away to right and left, lead down to the two bronze pegasi guarding the lake; massive Gunneras only could hold their own with the sheet of water and the 100 feet fountain rising from the central triton.

It is on the broad second terrace, level with the mural sundial, that some remarkable topiary work has been produced. Fig. 129 shows the geometrical beds filled with clipped Yews, then in their rich bronze young foliage, surrounded by the vivid green of Box. Around these blocks of dark colour runs a narrow planting area, just set out with Begonias and Antirrhinums for summer colour. The striking dark green sentinel Cyresses and the Portuguese Laurels clipped into round heads, 10 feet wide on 5 feet stems, give a superb and severe formal finish to the prospect. Amongst the many other interesting details of the statuary and buildings the little guide book contains the following paragraph:—

“Looking over the Lake are the Terraces which were built by the SEVENTH VISCOUNT POWERSCOURT who laid the foundation stone in 1843, the work not being completed till 1875. These Terraces and the Ornamental Gardens were designed by MR. DANIEL ROBERTSON who was wheeled about the place in a wheelbarrow grasping a bottle of Sherry. When the Sherry was finished MR. ROBERTSON ended his designing for the day. Under this somewhat unorthodox direction, one hundred men with horses and carts carried out this magnificent piece of landscape gardening.”

To the right of the south front is a further formal garden embellished by wrought iron gates of English and continental workmanship and some more impressive Portuguese laurels. Flower borders were beginning to give colour and a massive column of richest green proved to be a vigorous *Libocedrus decurrens*, with six stems.

Leaving this almost unparalleled splendour, my guide, MR. J. PERKINS, the head gardener, kindly took me down to the woodland valley where Conifers of every sort are in splendid condition. The very rare *Araucaria Cunninghamii*, immense trees of *Cupressus macrocarpa*, *Abies grandis* and *cephalonica*, *Pinus Jeffreyi*, *Picea Engelmannii* and others crowded upon us. The light lime-free loam seems to suit everything well, judging by the luxuriant growth. The view looking up over the lake to the house above was a wonderful contrast to the vegetation of the valley.

The Japanese garden, made in 1908, was suffering rather from lack of attention during the war but was being resuscitated and many fine Maples, Bamboos, clumps of Primulas, Irises etc., were noted among its hillocks and bridges. We then went up to the Garden Tower built in 1910-12 where are gathered many historic firing pieces, dating from the Spanish Armada, and from whose walls, looking over the valley filled with Conifers, another view of the Sugar Loaf mountain and its neighbouring hills is obtained.

This magnificent estate includes, I am told, the highest waterfall in these Islands, and on leaving MR. PERKINS I went through a wide Oak-scattered valley, with never a sound apart from the birds, eventually coming upon this great and graceful slanting white slide of water, partially and prettily veiled by lichen-clad Oaks.

The complete change from a grand formal garden to one of intimate charm, or vice versa, is one of the delights of a garden tour. The next morning I went to Old Conna Hill, where MISS RIALI has a garden full of good things, cared for by COL. AND MRS. RIALI. It is a very old garden, records going back as far as 1766—when gardeners' wages were 8d. per day—although the house is more modern. It was interesting indeed going round with COL. and MRS. RIALI and MR. WEBSTER, head gardener at Old Conna for 50 years; the sudden death of this fine old man some months later was a great loss, as he knew the history of so many of the trees and shrubs.

The house has several good things on it including a *Fremontia californica*, which was well covered with its dark golden blooms when I was there. From the drive in the front one looks across a rising lawn to great trees among which *Acer pseudoplatanus Leopoldii* stood out in its sulphur-green from all the others. Cedars and other Conifers in spires of varying greens contrast with mounds of hybrid Rhododendrons down a winding walk to a door in a dark, shaded wall facing north.

It was again a day of dazzling sunshine, but I was not prepared at all for the colourful prospect when the gate was opened, and the memory of that delightful surprise is vivid now. The gate gives on to a long rectangular garden where simplicity of design goes hand-in-hand with a brilliant cottage-garden mixture of good plants. The eye is carried down the central path to the lower gate and the long beds on either side are filled with Scots Roses, Lilies, Pinks, Peonies, Geraniums (*armenum*, *pratense fl. pl.*, and *ibericum*), Aconitums, Delphiniums, and other favourites; a very showy patch of lemon yellow was given by the dandelion flowers of *Urospermum Dalechampii*. On the right the view is bounded by an old Yew hedge, while a wall on the left is covered with

sun-loving plants like *Ceanothus austromontanus*, *Clematis balearica*, *C. Armandii*, Solanums and old Tea Roses Climbing 'Devoniensis,' 'Marie van Houtte,' and 'Homère.'

The view from this point, 300 feet above sea level, shows above the shrubs the rounded outline of Bray Head, two miles due south. The steeply sloping rather hungry soil is constantly sun-baked giving many warm corners for tender plants, but, owing to the slight rainfall, is a drawback in periods of drought. Frost is generally negligible, but during a disastrous spell in February 1947 10° was registered.

What is claimed to be the first Cordyline planted outside in these parts raises its wide and many crowned head above the wall, in a smaller grassed garden beyond; here are plantings of Cherries, Lilies, and Magnolias, including *M. Watsonii*. Further old walls carried *Rosa bracteata* (throwing suckers some feet away from its stem), *Dendromecon rigidum* and *Mandevilla suaveolens*, and the area enclosed is crossed by paths whose borders are broken by big specimens of *Escallonia pterocladon*, Myrtles, Pittosporums and old fashioned Roses. These are MRS. RIALI's special delight; they were not fully in flower but great promise of bud was seen on such famous varieties as 'Celestial,' 'Maiden's Blush,' 'Koenigin von Danemarck' and 'Cardinal de Richelieu.' Modern Roses in beds by a Lily pool were also promising well. A grey-green Thistle, *Cnicus Velenowskyi*, 3 feet high, with angular buds like grey top hats was an unusual sight, while a grouping that particularly pleased me was of yellow *Coronilla cappadocica* and orange Marigolds with the silver-and-white of *Anthemis Cupaniana* near by.

Apart from this walled garden where so many good things grow, there is a winding walk, again well stocked with larger shrubs like *Acacia dealbata*, *Tricuspidarias*, *Drimys*, *Eucryphias*, *Illicium religiosum*, *Brachyglottis repandu* (8½ feet high and in full flower), which led us down to a glade and stream under noble-stemmed trees where *Rodgersias*, *Primulas*, and other marsh plants were happily grouped.

It was late afternoon when I reached Mount Usher, the famous garden belonging to MR. E. H. WALPOLE, some miles south of Bray. Here indeed was a richness, mostly carried by the memory and my note book, as the weather broke and cloudy days ensued. One would need several days to examine all the thousands of specimens of trees and shrubs and plants in this wonderful collection. Blessed with a small river, which is broken by rocky weirs and traversed by no fewer than three suspension bridges, MR. WALPOLE and his forbears have made a garden of great botanical value coupled with scenic beauty in a climate mild and conducive to very luxuriant growth.

Since 1868, when MR. WALPOLE's grandfather first took an interest in the property, planting has been in progress. And not only planting, but the enlargement and improvement of the property has been of intense interest to the three generations of gardeners; the present house stands on the site of the old mill, which was worked by the River Vartry.

Here was my first sight of the old double yellow and the old double brown Wallflowers growing happily; here a rocky slope, set with selected alpine plants amongst which was the perennial *Saxifraga longifolia* 'Walpole's variety'; there a wall covered by some rarity of the climbing

world; next the grey house, with *Watsonias* under the windows, and its quiet lawn, dominated at the time of my visit by an immense plant, with arching branches in full flower, of *Abelia triflora*, 24 feet high, and rich with honey scent. (Fig. 126.) From this lawn one can look up-stream under a magnificent Sycamore to new plantings and a summerhouse, or downstream to the shady reaches. Then again the eye can travel up a long sloping vista called the Rose Walk—although I believe its chief beauty is numerous groups of Azaleas—heavily hung with a variety of trees of indescribable diversity. Immediately south of the house runs an avenue of hardy Palms and the Mount Usher Eucryphia.

In addition to these several radial vistas one has a rich planting on the opposite bank; the unique low-growing golden *Taxus baccata Baronii* were very dominant, and many and varied shapes of Conifers and shrubs created an ever-satisfying picture. A specimen of *Tsuga canadensis Sargentii pendula* is some 12 feet high and 45 feet in circumference. Under the shade of greater things—the Nothofagus, Magnolias, Eucalyptus, Cherries, etc.—grow mats of *Iris gracilipes*, Hydrangeas, Hostas, Gentians, Lilies, *Holcus mollis*, *Stipa pinnata*, *Orchis foliosa*, Primulas, Dianellas, and a host of ericaceous shrubs.

To the north of the house is a winding walk between 15-feet-wide shrubs of *Viburnum tomentosum* 'Lanarth variety,' underplanted with the great grey-leaved *Hosta (Funkia) glauca*. At this, the more gardened end of this plantsman's paradise, a special brick wall with widely projecting arms has been built to give shelter to things that are not hardy even at Mount Usher—such as *Musa Basjoo*, rare Gladioli and many plants beyond my ken.

Going down-stream some tall Eucalyptus, the poplar-like *E. gigantea*, and grey *E. coccifera* fully in flower, *EE. Moorei*, *Gunnii*, *urnigera*, *viminialis* and others, a 20-feet-square *Cornus capitata (Benthamia fragifera)* heavily covered with its rich ivory yellow flowers, *Nothofagus Dombeyi* and *obliqua*, *Populus Maximowiczii* and the blue-leaved *P. Wilsonii*, Tsugas, *Buddleia Colvillei*, *Sorbus Vilmorinii* (20 feet high by 24 feet wide), *Acer reticulata*, *Deutzia mollis* (one of the most handsome species), *Magnolias Campbellii*, *Delavayi*, and *salicifolia*, *Abies concolor candicans* in creamy grey, *Fagus Engleriana*, *Sorbus Thompsonii*, *Betula utilis*, *Styrax* and *Stewartia* species, *Eucommia*, and *Castanopsis* are just a few of the specimens that come to mind. One memorable group had as its centre-piece a specimen of *Cornus Kousa* 18 feet high by 25 feet wide (Fig. 127); its great fan-like branches were thickly set with thousands of cream blooms, while around stood *Pinus Montezumae* shimmering in grey-green with every breath of air, a *Davidia involucrata* with some large white bracts still hanging above a sward whitened with its fallen blooms, and *Cercidiphyllum japonicum*. The latter always appears to me to have every leaf at the ideal poise, and is very beautiful at all seasons and interesting historically withal.

The whole place is filled with horticultural and natural interest. Many plants are seeding themselves in the humid conditions, and the banks of the river are overhung with ferns, Bamboos, and many a lovely tree. MR. GIFFNEY, MR. WALPOLE'S able head gardener, takes as great a delight in the welfare of the many beautiful things under his

care as the owner, and it was a pleasure to go round and hear of so many plans for the future from them both. Planting up-river, along the banks, has been greatly extended and the next few years should see many interesting shrubs and trees coming into their own in this fascinating collection.

I was due later on the following afternoon to visit another intimate garden filled with good things, tended by MR. AND MRS. GEORGE SALMON, at Larchfield, on the Dundrum road. Here in a very limited area is a collection of over a thousand varieties of Roses, including species, modern varieties, and a rich planting of "old" Roses—the gallicas, Mosses, centifolias, damasks, etc., and it was my good fortune to be there at flowering time. The soft pinks, mauves and rich purples, light crimsons and the whites of these fine garden shrubs made a lasting picture in the evening light, and the scent pervaded everywhere. MR. SALMON produced a bloom 'Le Roi à fleur pourpre'—an almost extinct rarity and amongst the richest of the purples. It was good to feel that this variety will now become available again thanks to his care. A very up-to-date collection of Bearded Irises was given an open site—rather difficult to find in this garden of winding grass paths and a fresh interest at every step. For MR. AND MRS. SALMON seemed to have every choice shrub that one hears of to-day—all the Viburnums, Hamamelis, Philadelphus, Deutzia, etc.; a young Davidia was doing well, and a settled plant of *Malus ioensis* fl. pl. must be a lovely sight every May. And under all these shrubs are the Hellebores, the Hostas, the Gentians, Lilies and other bulbs and the great collection of Peony species and varieties that knit the beds and borders into an interesting whole.

(To be concluded)

SOME CHILEAN PLANTS CULTIVATED IN BRITAIN

G. W. Robinson

PART III

SOUTH AMERICA is noted for the brilliance and diversity of its Composites, many of which, e.g. Dahlias, Helianthus, and Zinnias, contribute largely to floral effects in our Parks and Gardens.

One of its most interesting genera is Mutisia, a genus of shrubby tendril-bearing climbers or scramblers. One section of the genus is represented in Chile and of these several species have been in cultivation.

The best known of them is *M. decurrens* with beautiful orange-yellow flowers up to 4 or 5 inches across. It has long been in cultivation, it was in fact collected by RICHARD PEARCE, and introduced by MESSRS. VEITCH in 1861. It is usually treated as a wall plant, but its natural

habit is to overgrow low-growing trees and shrubs, largely evergreens, and to produce its flowers in abundance only when it has succeeded in overtopping these. Consequently its roots are tucked away in deep shade and amongst all the dead foliage and detritus of woodland. I believe that exposure of the base of the plants is one of the principal causes of failure in gardens. I have seen fine plants in various parts of Britain from Edinburgh to Sussex, but there is no doubt it is a capricious plant. The species in which I was most interested is *M. subulata* which has narrow thread-like leaves and brilliant red flowers. It is figured in *Bot. Mag.* t. 9461. There is a lovely painting of it in the North Gallery at Kew, No. 831. It was first shown by MR. HAY in 1929 and the plant shown is, I am pleased to say, still alive at Kew. One of the difficulties of collecting the plant is that it so frequently uses a poisonous evergreen as its host. This shrub *Lithraea venenosa* brings out a kind of eczema akin to that of Poison Ivy. My stock, by the way, was collected in the coastal area of Valparaiso province and can only be grown as a cool-house climber. This also applies to *M. ilicifolia* which has broader and, as the name suggests, holly-like foliage, and pink flowers. Several species were obtained by MESSRS. GOURLAY and ELLIOTT and also by MR. COMBER, some of which are proving hardy. MR. COMBER's best are, I think, *M. retusa* and *M. oligodon*, but I have not yet had an opportunity of trying them personally.

Another familiar climbing genus in Chile is Proustia. *P. pyrifolia* though it was introduced so long ago as 1864 is rarely grown outside Botanic Gardens. It is a tender vigorous-growing scrambler with hooked spines and glabrous coriaceous foliage; the flowers are not brightly coloured but borne profusely and decorative, in a quiet way, as the pappus becomes purple on maturity. There is an excellent plate in *Bot. Mag.* t. 5489.

One of the most striking of Composites, and one of the few really woody plants in the family, is Dendroseris. *D. littoralis* is really a native of Juan Fernandez (a Chilean island some 400 miles out in the Pacific) but is cultivated on the mainland. It bears racemes of brilliant orange flowers. It is, as might be expected, tender, but is still, I believe, in cultivation at Kew from seeds I collected in 1926.

A brilliant and beautiful plant, not so well known as it might be, is *Triptilion spinosum*, which gained an Award of Merit in 1928 from MR. COMBER's seed. The flowers are Forget-me-not like, bright blue with a white centre and borne in large corymbs. The vernacular name is 'Siempreviva' (ever living), as they last so long. There is also an annual white-flowering species, *Triptilion cordifolium*. I reintroduced it in 1926 but it did not remain long in cultivation. It had been introduced in 1824 and figured in *Bot. Reg.* t. 853. *Senecio Smithii* is an excellent bog plant from the Magellan region with white flowers and grey foliage. *S. chilensis* also has silvery foliage but large bright-yellow flowers. It has been introduced several times but has never become popular, perhaps because of its obvious relationships.

The genus Applopappus or Haplopappus is a huge one and contains a number of small-growing sub-shrubs mostly with yellow or gold flowers and coriaceous evergreen foliage. At least two of these have been

in cultivation in recent years: *H. pectinatus* with pale yellow flowers is found from Talca to Concepcion and must, I think, have been introduced by MR. ELLIOTT, and *H. coronopifolius* with small gold flowers was found by MR. COMBER in the Southern Provinces and introduced under his No. 424. *Baccharis patagonica* is, of course, an old plant in cultivation and is one of the hardiest woody Composites. It is useful as a windbreak and stands both drought and wild weather, well. Other Composites sometimes seen are MR. ELLIOTT's little *Perezia linearis*, not a very easy plant to cultivate, and the easy but somewhat coarse *P. multiflora*; another little annual is *Moschardia pinnatifida* with numerous white or lilac flowers.

Gentaurea chilensis is an arborescent species common in Central Chile. It forms large specimens up to 6 feet across, and during the hot summer sheds its foliage. The flowers are pink in bud but open white and are so much as 4 inches in diameter. It was not in cultivation until I sent it to Kew about 1926, and to MR. HAY in 1929. The latter published a photograph of it in *Gard. Chron.* Sept. 13, 1930, and included it in his *Plants for the Connoisseur*.

Given a sunny warm situation, there are few more striking herbs in cultivation than *Lobelia Tupa*. It will reach 5 or 6 feet high under favourable conditions and except on cold wet soils does not require winter protection. The bold pale green foliage suggests a *Verbascum*, but the inflorescence consists of blood-red flowers 2 inches in length borne in racemes a foot or more in length. It has been in cultivation since 1824 and is figured in the *Bot. Mag.* t. 2550 and the *Revue Horticole* of 1898. It is frequently 10 or 12 feet high in Chile and, though it cannot quite rival its Central African relatives, it has at least the advantage of comparative hardiness. There is a closely allied species similar in habit with chocolate or maroon coloured flowers which is, I believe, *L. polyphylla*. Closely related to these giants, yet the most extreme contrast, are two creeping prostrate genera, *Pratia* and *Hypsella*. *Pratia repens* is a native of the Magellan Region and has dark green reniform foliage and white or violet tinted flowers. It is quite an old plant in cultivation, and is used for carpeting and Rock Garden planting. The same applies to *Hypsella longifolia* a mat-forming perennial which can, under favourable conditions, become invasive. In the right place, however, it is attractive, with *Lobelia*-like white or lilac flowers followed by yellow fruits. Most of the stock now in cultivation is probably from MR. COMBER'S No. 146.

Pernettya is a genus which runs through the Andes and foothills from the Equator to the Antarctic, and gardeners fortunate enough to be on lime-free soils will need no introduction to *P. mucronata*. It is perfectly hardy and has been in cultivation since 1828. The lovely and diversely coloured fruits of the Davis hybrids are some of the finest berried shrubs grown. *P. furiens* a compact little plant with white flowers, has in turn been placed in several genera including *Arbutus* and *Gaultheria*. It is common in the wet belt from Concepcion to Valdivia. (*Bot. Mag.* t. 4920 in 1856). *P. Pentlandii* is also figured in plate 6202, it has white flowers and black fruits. *P. furiens* was given an Award of Merit in 1927 when shown by MR. REUTHF.

Buddleia globosa, the Orange Ball tree, was one of the earliest Chilean shrubs to be introduced to British gardens, so long ago as 1774. It is remarkable for the immense number of flowers packed into the spherical inflorescence and for its beautifully veined pale grey woolly leaves. Usually about 12 or 15 feet high, it is hardy in most parts of Britain though it may be cut back to some extent by severe frost. This shrub and *Desfontainia* are the strangest of bedfellows, and extremely unlike in habit and flower; yet both are members of the same family Loganiaceae.

Desfontainia spinosa, the Patagonian 'Holly,' is an extremely slow-growing evergreen which under favoured conditions will reach 8 or 10 feet. It has a wide distribution from tropical S. America down the West Coast to Valdivia. It does not seem happy in the London area, but I believe this fact is due to the drier soil and atmospheric conditions, rather than to cold, especially as I have seen excellent plants in cold Cotswold gardens. The dark green glossy and spiny leaves, closely resemble those of Holly, but are borne in opposite pairs, the flowers funnel-shaped, some 2 inches in length, and brilliant scarlet in colour on the outside, tipped with deep yellow in the mouth of the corolla. They are similar in their solid wax-like texture to those of *Lapageria* and *Philesia*. It is strange how frequently this combination of colours occurs in S. American flowers. It is one of the many good plants introduced for MESSRS. VEITCH by LOBB in 1843, and again later by PEARCE. It received the Award of Merit in 1931 when shown by SIR J. RAMSDEN and is figured in the *Bot. Mag.* t. 4781.

Convolvulaceae are represented by *Nolana*, a genus of fleshy succulent annuals, procumbent in habit, and all with purple to blue flowers. Three species at least are in cultivation in Botanic Gardens and occasionally in Annual borders and "Blue" borders. *N. paradoxa* (sometimes listed as *atriplicifolia*) is glabrous, *N. lanceolata* (*Bot. Mag.* t. 5327), is more or less hairy, and *N. tenella*, figured as *N. paradoxa* in the *Bot. Mag.* t. 2604, has viscid hairs. They are maritime plants and I well remember seeing their Gentian-like open bells, in company with *Nierembergia rivularis*, within a few feet of the Pacific. This latter species, *N. rivularis*, the Cup Flower, is a representative of the Solanaceae, a delightful little plant where it does well. A prostrate growing herbaceous perennial, it is usually grown on a Rock Garden but it undoubtedly requires plenty of moisture at the root and in dry localities is best grown as a bog plant. Full sun is essential if it is to produce its large pure-white bell-shaped flowers (*Bot. Mag.* t. 5608). In this family also, is one of the most prolific of all parasites, *Cuscuta chilensis*. The rapidity with which it can grow and the extent to which it can smother its host must be seen to be believed! It has been brought over mixed with seeds but so far as I know has not become established in Europe.

The Potato family is well represented both in shrubby and herbaceous genera and is as diverse in character as one could wish. One of the most characteristic and certainly one of the best known is the tree Potato, *Solanum crispum*, and its variety *autumnale*, perhaps better known as 'Glasnevin var.' Though it does at times suffer severely from frost, I have seen plants so much as 25 feet high in cold midland localities, and given a warm sunny situation it is wonderfully free flowering.

An allied species, *S. pinnatum*, is equally decorative and free in Chile, but though introduced by both MR. ELLIOTT and myself it does not seem to have proved sufficiently hardy and has dropped out of cultivation. One of MR. COMBER's plants, *S. valdiviense*, however, proved hardier, as it hails from further south, the region of Valdivia and the Lake District. It is a free flowering shrub with mauve or violet flowers. It was given the Award of Merit in 1931 and figured in *Bot. Mag.* t. 9552.

Allied to these are the Cestruums but again they are tender with the exception of *C. Parqui*. This is extremely common in Chile but will never be popular in cultivation owing to its somewhat dingy yellow flowers and unpleasant odour. It is usually to be found in Botanic Gardens. There is, in the Chelsea Physic Garden, a very old plant, which, though cut back hard in severe winters, will, in most years, flower from June until frost cuts it, reaching 8 to 10 feet in height. It has been cultivated since 1787. *C. glaucum*, a tender, quick-growing species, is also grown in botanical collections. It has glaucous foliage and yellow flowers.

An allied plant, though quite unlike the preceding, is *Fabiana imbricata*. It is most interesting botanically as in foliage it resembles the Ericaceae much more than any member of the family to which it belongs. Growing some 6 feet high with a graceful habit, it produces its small tubular white flowers from June onwards. The violet-flowered form, though it had been in cultivation, had been lost, until reintroduced by both COMBER and ELLIOTT. MR. COMBER's plant received a F.C.C. in 1932.

The two best known herbaceous genera are without doubt Salpiglossis and Schizanthus; the species are rarely seen outside Botanic Gardens but the garden forms which have been developed from them are, of course, known and grown throughout the world. *Schizanthus pinnatus* first flowered in 1823, and Salpiglossis was introduced about the same time. Both are, of course, annuals, but in their native habitat they grow by the million and very lovely they are.

(To be continued)

WISLEY TRIALS, 1949-50

PRIMULA SINENSIS TRIED AT WISLEY 1949-50

Twenty-three varieties of *Primula sinensis* and *Primula sinensis stellata* were received at Wisley for trial in 1949. These were sown under glass on June 17, 1949, and when large enough to handle were pricked off into boxes, later being transferred singly into 60's sized pots. When well rooted and growing freely they were finally potted in 5-inch [48's] pots, the John Innes potting compost being used throughout. Fifty plants of each were grown. All grew well and flowered freely from December onwards.

The "Giant" forms such as 'Orange Glow,' 'Startler,' 'Crimson Glow,' 'Salmon King' and 'Crimson Star' are tetraploid varieties and these on the whole are very vigorous with larger flowers and from the appearance of the plants in the trials it would seem that they are rather later to flower and not quite so floriferous as the older varieties.

The trial was finally inspected by a sub-committee of Floral "A" Committee on January 19, 1950, who made their recommendations for awards as given below. The number in brackets following each variety is that under which it was grown at Wisley.

Good commercial stocks of the following varieties were grown for comparison: 'Coral Pink,' 'Giant Crimson,' 'Vesuvius' and 'Symmetry.'

PRIMULA SINENSIS VARIETIES

FLOWERS DOUBLE

Soft Salmon Pink

The following variety was grown: DOUBLE CHARM (Hurst) (1).

Orange-Scarlet

The following variety was grown: DOUBLE DAZZLER (Hurst) (9).

FLOWERS SINGLE

Pale Pink

Pink Enchantress (raised, introduced and sent by Messrs. Hurst & Son Ltd, Houndsditch, London, E.C.3). **H.C.** January 19, 1950.—Plant 12 inches tall, free flowering, carrying four or five flower spikes; flowers $1\frac{1}{2}$ inch diameter, Neyron Rose (H.C.C. 623/1) at margins of petals passing to (H.C.C. 623/3) at centre; eye green. A true even stock. (3).

Soft Rose-Pink Shades

Lachröschen (raised, introduced and sent by Samen Mauser, Zurich, Switzerland). **A.M.** January 19, 1950.—Plant 10 inches tall, free flowering, carrying four spikes per plant; flowers $1\frac{1}{2}$ inch diameter, French Rose (H.C.C. 520) heavily overlaid with Begonia (H.C.C. 619); eye greenish-yellow. A true and even stock. (2).

The following varieties were grown: LOVELINESS (Sutton) (5), SCHÖNHEIT LACHSORANGE (Mauser) (4).

Old Rose

The following variety was grown: ZUKUNFT (Mauser) (12).

Orange-Scarlet Shades

Dazzler (raised, introduced and sent by Messrs. Hurst & Son, Ltd., Houndsditch, London, E.C.3). **A.M.** January 19, 1950.—Plant 10 inches tall, free flowering compact habit, carrying three or four spikes per plant; flowers $1\frac{1}{2}$ inch diameter, Mandarin Red (H.C.C. between 17 and 17/1) on a base of Azalea Pink (H.C.C. 618); eye pale greenish yellow. A true even stock. (10). Also sent by Messrs. Sutton & Sons, Ltd., Reading, whose stock of this variety was **Highly Commended**. (7). (**A.M.** 1934).

His Excellency (raised, introduced and sent by Messrs. Hurst & Son Ltd., Houndsditch, London, E.C.3). **A.M.** January 19, 1950.—Plant 11 inches tall, free flowering, carrying four spikes per plant; flowers $1\frac{1}{2}$ inch diameter, Vermilion (H.C.C. between 18 and 18/1) on a base of Begonia (H.C.C. 619); eye greenish-yellow. A true even stock. (8). Resembles a more vigorous, somewhat paler, form of 'Dazzler.'

The following variety was grown: GIANT STARTLER (Sutton) (13).

Crimson Shades

Scarlet King (raised, introduced and sent by Messrs. Sutton & Sons, Ltd., Reading). **A.M.** January 19, 1950.—Plant 12 inches tall, free flowering, fairly compact habit, carrying four or five spikes per plant; flowers $1\frac{1}{2}$ inch diameter, Currant Red (H.C.C. 821/1) with a Blood Red (H.C.C. 820) sheen; eye greenish-yellow. A true even stock. (14). (**A.M.** 1939).

Papa Volpp (raised by Papa Volpp, introduced by Messrs. Haubensak, Basel, and sent by Samen Mauser, Zurich, Switzerland). **H.C.** January 19, 1950.—Plant 11 inches tall, very free flowering; flowers $1\frac{1}{2}$ inch diameter, Currant Red (H.C.C. 821/1) with a Blood Red (H.C.C. 820) bright sheen; eye greenish-yellow. A true even stock. (11).

The following variety was grown: CRIMSON GLOW (Sutton), a "Giant" type (15).

PRIMULA SINENSIS STELLATA VARIETIES
FLOWERS SINGLE

Pale Pink

Gaiety (raised, introduced and sent by Messrs. Sutton & Sons, Ltd., Reading). **A.M.** January 19, 1950.—Plant 14 inches tall, free flowering, carrying five or six flower spikes; flowers $1\frac{1}{2}$ inch diameter, Neyron Rose H.C.C. 623/2) flushed with Camellia Rose (H.C.C. 622/2); eye pale greenish-yellow: A true even stock (17).

The following variety was grown: SALMON QUEEN (Sutton), a "Giant" type (20).

Salmon Shades

Enchantress (raised, introduced and sent by Messrs. Sutton & Sons, Ltd., Reading). **A.M.** January 19, 1950.—Plant 15 inches tall, free flowering, carrying five flower spikes per plant; flowers $1\frac{1}{2}$ inch diameter, Begonia (H.C.C. 619) flushed with Vermilion (H.C.C. 18/1); eye pale greenish-yellow. A true even stock. (18).

Salmon King (raised, introduced and sent by Messrs. Sutton & Sons, Ltd., Reading). **A.M.** January 19, 1950.—Plant very vigorous, 15 inches tall, rather later to flower; flowers $1\frac{3}{4}$ inch diameter, Begonia (H.C.C. 619) heavily overlaid with Vermilion (H.C.C. between 18 and 18/1); eye greenish-yellow. A true even stock. (21). A "Giant" form.

Orange-Scarlet Shades

Guardman (raised, introduced and sent by Messrs. Sutton & Sons Ltd. Reading). **A.M.** January 19, 1950.—Plant 16 inches tall, free flowering; carrying five or six flower spikes per plant; flowers $1\frac{1}{4}$ inch diameter, Vermilion (H.C.C. 18) flushed Mandarin Red (H.C.C. 17); eye pale greenish-yellow. A true, even stock. (22).

Orange Glow (raised, introduced and sent by Messrs. Sutton & Sons, Ltd., Reading). **A.M.** January 19, 1950.—Plant vigorous, 15 inches tall, free flowering, carrying five or six flower spikes per plant; flowers $1\frac{1}{2}$ inch diameter, Vermilion (H.C.C. 18/1) flushed with Mandarin Red (H.C.C. 17); eye pale greenish-yellow. A very true and even stock. (23). A "Giant" form.

The following variety was grown: VANGUARD (Sutton), a "Giant" form. A mixed stock (19).

Crimson Shades

Crimson Star (raised, introduced and sent by Messrs. Sutton & Sons, Ltd., Reading). **A.M.** January 19, 1950.—Plant vigorous, free flowering, 15 inches tall; flowers $1\frac{3}{4}$ inch diameter, Currant Red (H.C.C. 821) with a Blood Red (H.C.C. 820) sheen; eye yellowish. A true even stock. (27). A "Giant" form.

Fire King (raised, introduced and sent by Messrs. Sutton & Sons, Ltd., Reading). **A.M.** January 19, 1950.—Plant very free flowering, 14 inches tall, carrying five or six flower spikes per plant; flowers $1\frac{1}{4}$ inch diameter, Currant Red (H.C.C. 821) with a Blood Red (H.C.C. 820) sheen; eye yellow. A very much improved 'Vesuvius.' (14).

Deep Rose Red and Rosy Mauve Shades

The following variety was grown: GIANT HYBRIDS (Carter) (16), a "Giant" form.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1950

BULBS AND CORMS

Freesia 'Goldcup' A.M. February 14, 1950. Plant vigorous; flower stems strong and long; inflorescence seven- to nine-flowered; flowers widely expanded, $1\frac{3}{4}$ inch wide, sweetly scented, Chrome Yellow (H.C.C. 605) overlaid with Indian Yellow (H.C.C. 6). Raised by Mr. J. A. M. Goemans as the result of a cross between a selected yellow seedling and seedling 301, introduced and sent by Parigo Horticultural Co., Ltd., Bourne Road, Spalding, Lincs.

Narcissus 'Broadwater' A.M. April 4, 1950. A refined Large-cupped *Narcissus*, (Division 2a), with a flower 4 inches in diameter, well poised on a 19-inch stem. The Canary Yellow (H.C.C. 2) perianth segments were rounded, overlapping and exceptionally smooth, the outer ones being $1\frac{3}{4}$ inch long and $1\frac{1}{2}$ inch broad. The neat, chalice-shaped, Lemon Yellow (H.C.C. 4/1) corona was 1 inch long and $1\frac{1}{2}$ inch in diameter at its slightly indented and frilled margin. Raised and shown by Col. F. C. Stern, F.L.S., V.M.H., Highdown, Goring-by-Sea.

Narcissus 'Firemaster' A.M. April 13, 1950. A neat Large-cupped *Narcissus* (Division 2a) of striking colour, with a flower 4 inches in diameter, well poised on a stout 18-inch stem. The Aureolin Yellow (H.C.C. 3) perianth segments were rounded, smooth and overlapping, the outer ones being just under $1\frac{3}{4}$ inch long and $1\frac{1}{8}$ inch broad. The Indian Orange (H.C.C. 713/2) chalice-shaped corona was nearly 1 inch long and about $1\frac{1}{8}$ inch in diameter at its pleated and indented margin. Raised and shown by Mr. J. L. Richardson.

Narcissus 'Glenshesk' A.M. April 13, 1950. A refined white Trumpet *Narcissus* (Division 1c) with a flower about $4\frac{3}{4}$ inches in diameter well poised on a stout 18-inch stem. The perianth segments were broad and smooth, somewhat concave and inclined forwards, the outer ones being just over 2 inches long and about as much across. The bold shapely corona was about $2\frac{1}{4}$ inches long and a little more in diameter at its expanded and slightly reflexed margin. Raised and shown by Mr. Guy L. Wilson.

Narcissus 'Golden Ducat' A.M. April 18, 1950. As a variety for exhibition (votes 6 for, 1 against). A fine, fully double variety (Division 4), with a flower $4\frac{1}{2}$ inches in diameter, well poised on a stout 17-inch stem. The larger segments were Canary Yellow (H.C.C. 2) and the smaller segments interspersed between the larger were Aureolin Yellow (H.C.C. 3). A sport from *Narcissus* 'King Alfred' which occurred in Holland in the cultures of Messrs. Speelman & Sons. Shown by Messrs. G. Zandbergen-Terwegen.

Narcissus 'Jenny' F.C.C. April 4, 1950. This large-flowered *cyclamineus* hybrid received an A.M. on April 6, 1948. See *Journal*, vol. LXXIII, p. 355. Raised and shown by C. F. Coleman, Esq., Broomhill, Cranbrook, Kent.

Narcissus 'Mulrany' A.M. April 4, 1950. A fine, bold, Large-cupped *Narcissus* (Division 2a) with a flower $4\frac{1}{2}$ inches in diameter, well poised on a stout 20-inch stem. The Aureolin (H.C.C. 3) perianth segments were smooth, very broad and overlapping, the outer ones being

$1\frac{7}{8}$ inch long and 2 inches broad. The Lemon Yellow (H.C.C. 4) corona was of nearly trumpet length, being $1\frac{3}{4}$ inches long and just over 2 inches in diameter at its reflexed, indented and frilled margin. Raised and shown by Mr. J. L. Richardson.

Narcissus 'Petsamo' A.M. April 4, 1950. A bold and refined white Trumpet *Narcissus* (Division 1c) with a flower $4\frac{1}{2}$ inches in diameter well poised on a stout 20-inch stem. The perianth segments were overlapping and exceptionally broad, the outer ones being $1\frac{3}{4}$ inch long and just over 2 inches broad. The corona was a little longer than the perianth segments and about $2\frac{1}{8}$ inches in diameter at its reflexed, indented and frilled margin. Raised and shown by Mr. J. L. Richardson.

Narcissus 'St. Keverne' A.M. March 21, 1950. A refined, medium sized, Large-cupped *Narcissus* with a flower just under 4 inches in diameter, well poised on a stout 19-inch stem. The Aureolin Yellow (H.C.C. 3) perianth segments were smooth and overlapping, the outer ones being $1\frac{5}{8}$ inch long and $1\frac{1}{2}$ inch broad. The neat, deep Lemon Yellow (H.C.C. 4) corona was $1\frac{7}{8}$ inch long and $1\frac{3}{4}$ inch in diameter at its frilled and expanded mouth. Raised and shown by M. P. Williams, Esq., Lanarth, St. Keverne, Cornwall.

Narcissus 'Tudor Minstrel' A.M. April 13, 1950. A Large-cupped *Narcissus* (Division 2b) of exceptional size, having a flower $5\frac{1}{8}$ inches in diameter borne on a 23-inch stem. The white perianth segments were smooth, broad and overlapping, the outer ones being $2\frac{1}{8}$ inches long and nearly as broad. The Aureolin Yellow (H.C.C. 3) pleated, funnel-shaped corona was $1\frac{1}{8}$ inch long and nearly 2 inches in diameter at the mouth. Raised and shown by Mr. J. L. Richardson.

BOOK NOTES

"The Plums of England." By Dr. H. V. Taylor, C.B.E., V.M.H. 151 pp. Illus. Cr. Quarto. (Crosby Lockwood and Son Ltd.) 30s.

Here is a welcome addition to the library of all fruit-growers both commercial and amateur. It may be described as a companion volume to *The Apples of England* by the same author. This is an important book giving as it does a broad outline of the origin of the plum, its cultural requirements and the uses to which the different kinds of plums are best suited. In addition it is enhanced by thirty-two colour plates of worth-while varieties.

The text is arranged in two main divisions. The first part consists of eleven chapters covering a wide field. Chapter I is entitled "Botanical Considerations and Classes of Plums"; this gives a deal of information, of benefit to all interested in the history of the subject. Then follows an appraisal of the different "Root-stocks used for Plum Varieties." The next chapter pays tribute to the "Breeders of Plum Varieties," with a note on the process of pollination. Dr. Taylor mentions that there was no deliberate inter-crossing of two varieties until Thomas Andrew Knight began his work early last century. Then there is a chapter on "The Plum Blossom and Pollination"; this includes interesting details of observations by various workers on the dates of blossoming and other factors involved in the pollination of plums. This is followed by a discussion on "Districts Important for Plum Production," with other details which are of interest chiefly to those engaged in commercial plum growing. A separate chapter deals with "Soils and Nutrition" and another with "Diseases and Pests." "Plums and their uses" are described in a chapter which contains many matters of interest to those who are not only growers of plums. To quote from Dr. Taylor, "In these days it is customary to have the value of foodstuffs expressed in chemical terms, and man's daily requirements of food given in calories." "It is a doubtful method for expressing the value of dessert fruit." Under "Some Chemical Facts" the author gives some informative analyses. The somewhat difficult subject of "Plum Characters" is dealt with in an instructive

manner. Systems of classification as a means of identifying varieties are described and suggestions put forward with this object in view. "The plain fact seems to be that the Plum possesses too few individual characters, some of which are variable, and that a system of classification on the fruit characters alone is no easy matter to compile." Useful tables are given with colour, ripening period and shape of many varieties including the most popular ones. The final chapter in Part I on "Plum Varieties for Gardens and Plantations" is a short one being as to the former in effect a list of the Plums planted in the model fruit gardens at Wisley and as to the latter a number of varieties recommended for commercial use.

Part II of the book opens with a useful bibliography which should be of assistance to those readers desiring to know where to look for further information on the points mentioned earlier. The remaining pages contain descriptions of some 150 varieties of Plums arranged in alphabetical order. These descriptions are in some detail and make interesting reading, apart from being of considerable assistance in the identification of varieties.

The colour plates, which are of high technical quality, are interspersed amongst the reading matter throughout the book. This arrangement is very irritating, particularly when reference is being made to matters dealt with earlier in the book. It is suggested that a better arrangement would be for all the plates to be together, next to the descriptions of varieties. Each plate pictures a well-fruited portion of a lateral showing typical foliage, together with vertical sections of an individual fruit, one showing the suture line the other the stone in position; the stone is also shown as viewed broadside on and sideways.

As Dr. Taylor says, "The person who is really interested in his garden will want to know the names and will take more interest in the garden if they are known. The trees cease to be mere Plum trees and become trees with familiar names." This book will not only arouse the reader's interest but also foster it, and it is one to which all those who are in any way concerned with the culture of plums should have access.

HOWARD H. CRANE

"Ponds and Fish Culture for Pleasure and Profit." By C. B. Hall. 8vo. 244 pp. Illus. (Faber & Faber.) 18s.

Commercial fish breeding in this country is not an industry about which much is known by the average layman, nor has it ever assumed here the importance and scope attained in America and the Orient. Before the war great numbers of fish came in annually from the Continent and, with the addition of home supplies, created a plentiful and cheap supply for stocking lakes and pools. Of recent years, however, demand has greatly exceeded supply, a factor which has forced up prices to prohibitive limits. Many a pond owner has suddenly found that the dozen goldfish he introduced ten years ago to his pool, have bred prolifically and now represent a small fortune. These facts have naturally excited an interest in producing quantities in home waters, and for such enthusiasts the book *Ponds and Fish Culture* by Major C. B. Hall should prove invaluable.

The author has had twenty years of practical experience with freshwater fisheries, and his information on artificial hatching and rearing and selection of fish is sound and thorough. Possibly because of the commercial implications, much reference is given to trout cultivation. The artificial propagation of trout is intensely interesting and indeed essential since as the author says "If thousands of millions of trout were not every year artificially hatched and reared the species might become a rarity among fish."

Other chapters in the book deal with pond construction, appliances, feeding and enemies of fish, aquatic plants, the aquarium and a most interesting chapter on preparing fresh water fish for the table. When making a garden pond I sincerely hope that no one will follow the advice given on making artificial rocks. It is difficult to understand how any lover of nature can countenance such monstrosities, which are neither useful nor ornamental, and only suggest a use for cement. The chapter on water plants needs overhauling. The author claims (p. 183) not to include plants which are undesirable in ponds and yet mentions the rampagous *Potamogeton natans*, which will rapidly take possession of all the water surface. *Lobelia Dortmanna* is a plant for the connoisseur, it definitely will not grow in the average pond, but needs deep, clear lake conditions. Other assertions which do not tie up with facts are the remarks that frogs and toads eat water beetles, or the reasons given for frogs gripping fishes.

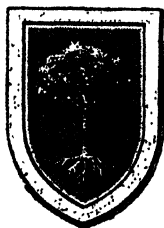
However these are small points and the book should fill a gap in the literature on the subject of fish breeding, and prove most useful to the man and woman engaged in the pursuit professionally or for pleasure.

FRANCES PERRY

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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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Part 7

July 1950

THE SECRETARY'S PAGE

ANNOUNCEMENTS—JULY AND AUGUST

Shows

TUESDAY, JULY 11. 12 NOON TO 7 P.M. First day of Fortnightly Show.

Summer Fruit and Vegetable Show.

*First day of British National Carnation Society's Summer Show.
Cactus and Succulent Society's Competition.*

WEDNESDAY, JULY 12. 10 A.M. TO 5 P.M. Second day of Show.
Second day of British National Carnation Society's Summer Show.

TUESDAY, AUGUST 1. 12 NOON TO 7 P.M. First day of Fortnightly Show.

Hardy Flower Competition.

Gladiolus Competition.

WEDNESDAY, AUGUST 2. 10 A.M. TO 5 P.M. Second day of Show.

TUESDAY, AUGUST 29. 12 NOON TO 7 P.M. First day of Fortnightly Show.

Cactus and Succulent Competition.

Plum Competition.

First day of British Fuchsia Society's Competition.

WEDNESDAY, AUGUST 30. 10 A.M. TO 5 P.M. Second day of Show.

Second day of British Fuchsia Society's Competition.

Lectures

TUESDAY, JULY 11 at 3 P.M. "Border Carnations," by MR. M. C. ALLWOOD, F.L.S., V.M.H.

TUESDAY, AUGUST 1 at 3 P.M. Masters Memorial Lecture, Part I "The Origin and Improvement of Cultivated Plants" by MR. M. B. CRANE, F.R.S., A.L.S., V.M.H. (John Innes Horticultural Institution).

Lectures—continued.

TUESDAY, AUGUST 29 at 3 P.M. Masters Memorial Lecture, Part II, "The Origin and Improvement of Cultivated Plants " by MR. M. B. CRANE, F.R.S., A.L.S., V.M.H. (John Innes Horticultural Institution).

Demonstrations at Wisley—The following demonstrations will be given at Wisley, that on the second day being a repetition of the demonstration given on the first:—

Fruit Garden

July 5, 6. Summer Pruning of Fruit Trees. (2-4 P.M.)

Flower Garden

August 2, 3. Vegetative Propagation of Shrubs and Herbaceous Plants. (2-4 P.M.)

Request for Old Copy of the Society's Proceedings—The Society is anxious to acquire for its library one or two more copies of the *Proceedings of the Horticultural Society of London* for the years 1838 to 1843, published in London in 1844. The Library Committee would be grateful to anyone who, having no further use for this volume, would be so kind as to present it to the Society.

Publications—*Some Good Garden Plants*. This book contains descriptions of all the plants which have received the Award of Garden Merit from 1922 to 1949, having been recently revised to incorporate awards made since the last edition was published in 1945. A number of new illustrations have also been added. This book, which is bound in paper boards, is obtainable from the Secretary, price 6s. post free, and should be of value to all gardeners. Pamphlet: *A List of Books for the Amateur Gardener*. This list, compiled by members of the Library Committee, is now available, price 6d. post free, on application to the Secretary.

WISLEY IN JULY

IN this month of high summer the emphasis moves from flowering trees and shrubs to herbaceous plants, thus making the Herbaceous and Annual Borders, the Floral Trial Grounds and Rock Garden the chief centres of interest, although one has but to visit the Rose Borders and Wild Garden to realize that they are not the only scenes of beauty.

Trained against the Laboratory walls is a Rose which never fails to draw admiring attention, the well-known 'Mermaid,' a single yellow *bracteata* hybrid which possesses the advantages of a long flowering period and evergreen leaves. Further along is *Fremontia mexicana* producing numbers of cup-shaped golden flowers offset by the attractive palmately-lobed leaves.

The broad Herbaceous Borders of brightly coloured flowers backed by the sombre green twin yew hedges create an outstanding feature in the

Gardens and one for which they are justly renowned. There are bold groups of such indispensable genera as *Helenium*, *Phlox*, *Anchusa* and *Rudbeckia* and among them plants less frequently seen such as *Verbena bonariensis*, the creamy-white *Clematis recta*, and the curved white racemes of *Lysimachia clethroides*. Grey-leaved plants such as *Artemisia Ludoviciana* and *Stachys lanata* are used with good effect to separate some of the stronger-coloured groups. The unobtrusive method of staking is worth studying, brushwood being almost solely employed. This saves laborious tying and yet gives sufficient support.

In the Award of Garden Merit Collection are some of the more outstanding perennial plants, not arranged as a garden feature as they are in Herbaceous Borders, but to show the plant as an individual. Among those so treated are *Veronica longifolia*, *Anthemis tinctoria* 'Perry's variety,' and the gay orange-flowered *Alstroemeria aurantiaca*.

Again this month, as in all others, Seven Acres has a charm of which no mere list of the plants in flower can give any conception. The broad sweep of grass leads the eye to a stretch of water dappled with many-coloured Water Lilies and margined with the blue spires of the North American Pickerel Weed, *Pontederia cordata*; rising gracefully behind these are the golden-green Willows and more delicate Silver Birches. Although the pond may be the focal point of the garden, there are bright colours to be seen among the Heathers. The varieties of *Erica cinerea* are soon supplemented by the Dorset Heath, *E. ciliaris*, and the Cornish *E. vagans*. There are some beautiful forms of the common Ling, notably the brilliant coloured *Calluna vulgaris* *Alportii* and a good tall-growing white variety, *C. v. Hammondii*. Fine plants of *Erica terminalis* and a large bush of *Genista cinerea* give height to the planting.

Few of the trees and shrubs in the Wild Garden are flowering now, but they serve as a shady green canopy for a wealth of Lilies, Campanulas and Primulas, and as a support for the flaming scarlet *Tropaeolum speciosum*, a Chilean climber. Among the Lilies flowering here are the showy scarlet and orange *Lilium pardalinum*, the tall and graceful *L. canadense*, the pale yellow *L. Szovitsianum* and the thick-textured blooms of *L. Hansonii* and its hybrids, while rising above them all are the huge white spires of *L. giganteum*. All these have long been established at Wisley, but the collection has been greatly augmented recently by other species and hybrids propagated at Wisley and by MR. JAN DE GRAAFF's generous gift of many of his outstanding hybrids raised in Oregon. The 'Bellingham' hybrids have much the same form as *L. pardalinum* but a wider colour-range; the 'Fiesta' group exhibit dark and richly-coloured flowers on plants with the habit of *L. Davidi*. The tall arching panicles of *Campanula lactiflora* carrying numerous pale blue bells mingle delightfully with the yellow corymbs of *Primula Florindae*. Several other herbaceous plants such as *Campanula latifolia alba*, *Digitalis ambigua* and *Lysimachia quadrifolia*, benefiting from the cool woodland conditions, have naturalized themselves with great harmony of both colour and form.

There are many charming plants to be seen on the Rock Garden; in the main they are blue, including a number of Campanulas and the allied genera of *Platycodon* and *Codonopsis*, summer flowering Gentians

and *Cyananthus lobatus* and *C. microphyllus*. *Mertensia sibirica*, whose leaves are said to taste like oysters, and *Jasione perennis*, a larger edition of the common Sheep's Bit, are also blue flowered; nor should one forget *Primula nutans*, the dense mealy heads of which are powder blue. On the margins of the Long Ponds many varieties of *Iris Kaempferi* are flowering, and there are also some newly acquired plants of hybrids belonging to the Louisiana group which vary greatly in colouring and height.

In the Alpine House there are a number of unusual and interesting plants in flower. The collection of Campanulas includes *C. Tymonsii*, *C. haylodgensis* and the white, lilac-veined *C. alsinoides*.

On Weather Hill the Annual Border and Rose Borders, each in their different way, create ribbons of colour stretching down the hill. Both these features are valuable additions to any garden, however small, and apart from their æsthetic value, visitors will no doubt find them of use also in the choice of individual varieties.

On Battleston Hill *Rhododendron auriculatum*, the last of a long succession, carries sweetly-scented flowers in company with *R. 'Polar Bear' (diaprepes × auriculatum)*. There is every promise that Lilies will thrive in this part of the Gardens, and already *L. testaceum*, *L. regale*, *L. Sargentiae*, *L. pardalinum*, 'Princeps,' 'G. C. Creelman' and the Oregon Olympic and Centifolium hybrids are well established. The Eucryphias are valuable at this time of the year when they produce numerous white flowers offset by dark green leaves. *E. glutinosa (pinnatifolia)* is to be recommended for general planting as it is somewhat harder than the stronger growing hybrid *E. nymansensis (glutinosa × cordifolia)*.

In the Floral Trials section the display of both Sweet Peas and Delphiniums comes to a close as this month advances, but as they wane their place is taken by the Gladioli and Annual Asters, the latter flowering until the first frosts.

Along the Terrace Walk the Formal Bedding is also a colourful sight, the beds being filled with a variety of Pelargoniums, Lobelias and many other tender plants.

From there the Greenhouses can be reached by way of a Lavender-bordered path, and by so doing visitors will see to advantage the lovely hybrid *Romneya Coulteri × trichocalyx* which is bearing huge white Poppy-like flowers among delicate blue-grey leaves. In the Stove House the curious Lily-like scarlet and yellow flowers of *Gloriosa Rothschildiana* are being abundantly produced, and there are also some interesting Orchids. The Half-Hardy House is also worth a visit at this time of year; there are two white-flowered climbers, *Mandevilla suaveolens* and *Solanum jasminoides*.

In the Vegetable Trial Ground two crops are of special interest now. An extensive trial of about 150 stocks of culinary Peas is at its best; and many different types of Lettuce are among the stocks contributed to the Invited Trial and received from the Seeds Import Board. Apart from the trials there is an unusually comprehensive collection of Mints recently obtained from nearly forty different sources. These are all of some culinary value, and show a wide diversity of character. By collecting these varieties into one place, it is hoped to straighten out the nomenclature of our cultivated Mints, which is at present somewhat confused.

THE GARDENS AT BODNANT

Lord Aberconway, C.B.E., LL.D., V.M.H.

*(Lecture given on May 2, 1950, THE HON. DAVID BOWES-LYON
in the Chair)*

The Chairman.—Ladies and Gentlemen—My job to-day is a very easy one and one which I am very proud to do, that is to take the Chair for our President's Lecture. It is particularly easy, because I do not have to introduce our Lecturer to any of you, since he is so well known to you already; and we all know him to be one of the greatest of gardeners. I have been a very fortunate person in having visited his gardens at Bodnant a number of times over a large number of years, and I ask him before he starts not to fall into the error our American friends often accuse us of, that is of understating his gardens too much. I at least, and some of you who have seen his garden, know it to be what I believe is the greatest of all gardens to-day; I will forthwith ask him to address you.

Lord Aberconway.—Mr. Chairman, Ladies and Gentlemen—In lecturing on my own garden I suffer from two disadvantages. In the first place, this is the first lecture I have ever delivered, so you must make allowances for me; in the second place, our Chairman has said I should not understate the merits of the Bodnant Gardens. If I was one of those Chinamen in whom politeness has been instilled for a period of thousands of years, I should say: "Poor I, this wretched rat that talks to you about the fifth-rate cabbage patch I call a garden." But that is rather foreign to one's own conceited attitude, and I shall therefore tell you what I think of the garden, if I can without putting it too high or too low. I would ask you yourselves to add that seasoning of proper humility which I really ought to add to my remarks.

Now the Bodnant Gardens stand chiefly on a slope facing to the west. Below that slope is a pleasant little valley where a stream called the Hierethlyn runs, and which is augmented by two tributaries running down through the gardens; and at the bottom of the gardens, 170 ft. below the house, runs the tidal river Conway; beyond the river Conway the land slopes up and up till it reaches nearly the summit of the Snowdon Range. You see from the house the mountain, Carnedd Llewellyn, only 60 ft. lower than Snowdon, and except for Snowdon, the highest mountain in England and Wales.

Now that gives you a wonderful view. The tidal river changes as the tide flows up and down; sometimes there are sandbanks, sometimes it is overflowing its banks; sometimes it is covered with white foam, at other times it flows along as a quiet stream. The mountains are different every time you look at them—to-day they are covered with snow. There are some covered with cloud, sometimes the sun catches them, sometimes it does not, and on a fine day when the sun sets behind them to the west, you get the most lovely clear outline of the mountains with the setting sun behind them. That is a very very great asset to any garden, a wonderful view—indeed it is the making of any garden.

My grandfather's predecessor built the house in 1792. The builder's father-in-law — he married the heiress of the estate — had been a Customs House officer at Exeter. In those days that was possibly a very lucrative occupation, because his son-in-law seemed to have plenty of money to build the house. He built it in place of an older house a little distance away, and chose the situation where you could best see that wonderful view. He was, moreover, a great tree planter, he planted Oaks and Chestnuts, and other trees, but above all he planted a great number of what was a very fashionable tree in the eighteenth century, that was Beech, an uncommon tree in Wales; and as the result there are magnificent old trees all round the garden, dating from 1792, more than 150 years ago; those, added as a foreground to the view, are a great attraction to the garden which no modern garden-maker could rival.

The garden fortunately has no lime in it, though there is limestone four or five miles away. It has a great deal of clay, but the clay is on the slope and so well drained—in fact I think more plants like clay on the slope than you would imagine. There is a great deal of wind from the south-west, but the south-west wind is mild and moist and does not do much harm. There is frost there, about the same amount as you get all round the south and north of London. It is not a mild climate, because though the beneficent Gulf Stream flows up along the western coast of Wales, there is a great and regrettable island called Anglesey which sticks out, and directs it up to Scotland instead of allowing it to flow round to the Conway River.

That is what my grandfather HENRY DAVIS POCHIN found when he bought the estate in 1875, some 75 years ago. He found the view, the grand mountains, he found the streams, he found the house, but he found no gardens whatsoever. There was not a garden, but there was one Corsican Pine and one Irish Yew, and that was all there was. He was a man of great and varied enterprise, he had tried many things in his life; they had all been successful, though he started out a relatively poor man; and he said "Now what shall I do to make a garden?" He got a very famous firm of Landscape Architects, MESSRS. MILNER, to lay out the gardens for him, and they laid out a beautiful garden, great spreading lawns under the big trees, a very quiet restful, reposeful garden. All round the house there was a terrace, and a steep, sloping bank. I remember when I was a child what fun it was to see the old stout butler try to come down that slope with a heavily loaded tea-tray for tea under an Oak on the lawn.

But beautiful as that garden was, it was only small in the first place. My grandfather in succeeding years enlarged it, especially along the little valley at the bottom of the garden and along the tributary streams. He planted, for he was very fond of them, a number of conifers, uncommon and rare conifers which to-day are of great size and great beauty because they were planted in rich, alluvial soil well at the bottom of this little valley or dell.

He died in 1895, some 65 years ago, and my mother inherited the garden from him. She was very keen on flowers, but in a garden laid out with great lawns and great trees it is very difficult to get places for flowers. Anything you plant, even shrubs, looks fussy and out of place.

She planted a fine herbaceous border on the outskirts of the garden, and then about 1902, I got hold of that nice material called squared paper on which you can make plans with a minimum of trouble.

My father was not fond of gardening, he devoted himself to forestry matters on the estate. My mother loved the flowers, and I loved first of all, flowering shrubs, and we thought it out together, and we drew a plan of terraces on one of the lawns. a lawn sloping west, a wind-swept lawn, rather a bare lawn, very dignified, but I confess most uninteresting. When I was about 25 she entrusted to me the complete digging up of that lawn and the making of stone terraces. She sent her men and masons there, and subject always to discussion with her—and valuable advice she gave—she entrusted all the work of terracing to me, and with it all the detailed work of the garden. We discussed it always, and she was one of those people who always approve of change, and who even in her old age had abundance of energy. It was a magnificent gift which in fact changed my whole life, because there are not many people who have had the advantage of having a great garden handed over to them at that age with liberty to do what they liked with it within reason, and funds generously available to do all that they wished.

No words can express how great a gift that was, an unusual and a great gift, and during her lifetime, she and I gardened in this garden together and I myself after her death, made it much what it is to-day.

The thing we devoted most attention to and what we regarded as important, firstly, secondly and thirdly, was design; design came first. You know the story of the old, bald-headed man. A small boy shouted after him, "Go on, old baldhead!" and he said "My boy, the head is a dome for noble thoughts, and not a mere rendezvous for hair." If some people who design gardens would say to themselves "A garden is a place for wonderful design, and not a mere rendezvous for odd plants," they would have better gardens than some of them have to-day.

Well then, we planted shrubs, but we did not plant Rhododendrons. My grandfather never planted Rhododendrons except some good old hardy hybrids, like 'Ascot Brilliant' which we still have. When I was 21 I remember discussing it with our Head Gardener, not MR. PUDDLE, but his predecessor. We discussed the possibility of planting some Himalayan Rhododendrons, and he said "Oh no, sir, they would never grow at Bodnant, don't try Himalayan Rhododendrons." For nine years I did not try them, and I have always regretted ever since that I took his advice, but he was an old man and I was a young man. We should not always take advice. About 1908 VEITCH were selling Rhododendrons raised from WILSON'S collection in China of 1900, and I thought that we would try some of these Chinese Rhododendrons. I reflected that the Head Gardener could not say that they would not grow because he had never tried them. At the same time I thought that we would grow Himalayan Rhododendrons among them, and we have them mixed to-day. Of course the Chinese and Himalayan Rhododendrons were a great success, and although those grown in Cornwall grow twice as fast, they do very well in Wales.

Those are a few introductory words about the garden, and I think

I can explain the garden best if I now show you the slides. The uncoloured slides were taken by our good friends *Country Life*, who have a wonderful photographer, and by the photographer attached to the R.H.S. The coloured slides which you will see later, and are chiefly about Rhododendrons, were taken by a neighbour of mine from coloured films sent over to me by a friend in the western United States, who wanted to show his friends what Rhododendrons looked like flowering in English gardens. With his permission I have a few of these to show you.

There are the terraces on the lawn, where my mother let me loose at an early age. (Fig. 132.) On the left is the little valley, beyond you see a small stretch of the tidal river Conway, and beyond again, never looking so large in a photograph as it does in real life, lies the beginning of the Snowdon Range of mountains. My grandfather was very fond of conifers, fine trees that were very much planted when he was laying out Bodnant Gardens, and he planted a very lovely silver Atlas Cedar, and in arranging the terraces, I arranged them round the Cedar so that it should not be disturbed. The photograph was taken from the house.

This photograph (Fig. 133) shows a much later addition to the garden. That curious garden house attracted me intensely when I was a very young man. It stood near Stroud in Gloucestershire. It was originally built as a garden house in 1720 or 1730, and some hundred years later the place changed hands and commercial buildings were built behind it, and they started a factory for making pins, and it was always known as The Pin Mill. When Birmingham became more skilled in making pins and made them on a larger scale by big machines, it became unremunerative, and the owners used it as a tannery where they made the coloured leathers which ladies used to like on the tops of their shoes; but it gradually fell into poor condition, dry rot got into the roof; an enormous factory chimney stood in front of it. I was able to make arrangements with the owner to take away all the wrought stone and the timber and the old Cotswold roof tiles, provided I left him an equally large place to store his hides, and an equally high building to contain his cistern which supplied the works; so away it came just before the last war, and it looks to have settled very cosily in the garden, and is a very lovely building. I can say that because I did not build it myself. Above it is a Rose garden. Along the terrace is a canal where SIR BERNARD FRYBERG practised for his Channel swim. At each end of the canal are Water-lilies, and behind the Pin Mill one of those old-fashioned Beeches.

At the other end of the canal, not so much for use, but as a nice finish to the terrace, we planted a stage with Yew hedges, and wings, and a little unroofed dressing-room, with two Cypresses at the side. (Figs. 134, 136.) Those tall dark trees are *Pinus insignis*, or *radiata*, they are only 43 years old, but you will see to what a height they have grown and what lovely trees they are. If any young person wants to plant a tree which will be a great old tree in his lifetime, let him plant *Pinus insignis*. People often think that one of these trees that I planted and which is 110 feet high is 120 years old, but it is only 18 years different in age from myself, and I am 18 years the elder.

That Cypress is the best we could do to replace the Italian Cypress. I wish we could grow Italian Cypresses in this country: MR. BOWLES has

grown a good one, but they are very rare, so one has to revert to the Lawson Cypress, *C. erecta viridis*, by no means a perfect substitute for the Italian *Cupressus sempervirens*. That seat is a copy of one designed by KENT.

From the upper lawn you see the wall below the Cypresses. I planted those trees, but the wall below replaced the stiff kind of railway embankment down which the portly butler brought the tea. You could not plant anything on the bank; plants looked uncomfortable at the bottom, but by putting a wall at the base of the bank, you get a border backed by good shrubs against the wall, which can be arranged with all sorts of herbaceous and other plants you like to put there, and you can grow them without the whole thing looking fussy. Behind the Cypresses you see the big trees planted in 1792.

The photograph (Fig. 140) shows a pond with Water-lilies. We grow our Water-lilies in that pond quite successfully because we take them out every two years. It is a concreted pond; we let the water out and replant the Water-lilies, giving them fresh soil and dividing them up, otherwise you get great mounds of leaves with very few flowers. On this pond I counted one hot June no fewer than 900 flowers open at the same time. They give a very wonderful show of colour and of beauty on the water. On that high wall we had some rare and tender things growing, but the great frost during the last war, when we had no less than 34° of frost, 2° below zero, did away with a certain number of our rarest species, among them great plants of *Eucryphia cordifolia*, some giant heathers, and other nice things; we have now replaced them by hardier plants.

There is a different view into the valley. (Fig. 137.) At the bottom is the stream with two little tributaries near it; that stream goes up about half a mile, and by the banks there are planted my grandfather's conifers, and one or two I planted myself where there have been gaps. There is a Japanese Umbrella Pine there, the tallest in cultivation, *Sciadopitys verticillata*. There is also one of the tallest Taiwanias in cultivation; it will grow about 200 feet high, long after we are all dead, and there is a tiny little plant of *Metasequoia glyptostroboides*. Fig. 138 shows another view of the dell, with another Beech and one or two of the older deciduous trees which are at the edge of the dell behind the conifers. You see how the bank rises beyond; that was planted by my father and mother about 1895 and 1898, in order to shelter from wind the rarer trees at the bottom of the dell. That is on the clay, the clay runs downhill, and I have an idea that the rain gets in at the top of the clay, runs down over the clay and keeps the roots of the trees slightly moist, because nowhere do trees do better than on that clayey bank. The clay is so tough that if you want to dig a hole you have to use a pickaxe, but there is about 18 inches of quite good soil above, and that bank also is a wonderful place for Rhododendrons. On that bank we grew fifty to sixty large plants of that fine Rhododendron hybrid R. 'Penjerrick,' not one of my hybrids, but from a very fine garden in Cornwall where they were grown from seed. I bought many of them and have never regretted planting Rhododendron 'Penjerrick.'

Up above there is a view of the old park where we started Daffodils,

not perhaps very good agriculture, but they look very lovely in the Spring. (Fig. 139.)

This photograph (Fig. 141) shows a little piece of ground which I have planted, which I am very fond of. It is planted with the Corsican Hellebore; you see its beautiful leaves and bell-shaped flowers of a strange pale green; these plants blossom in February and they "stay put" in a wonderful way; if you go there in June you can pick the same flowers that opened in February, and they are good enough to decorate your house. In the Summer you have these beautiful flower arrangements on the plants and lovely divided leaves. They are growing at the foot of a hedge of *Arbutus*.

We have a number of plants of *Eucryphia pinnatifolia*—I will not call it *glutinosa*—that is a botanists' name and I do not like it. It is an upright tree, 20 feet high; because it is upright, it does not spread too much and kill the *Rhododendrons*. It is always deciduous, but has a kind of idea in its mind that it does not want to be deciduous, so in the Autumn the foliage begins to become yellow and gold and stays on for six or eight weeks. It is not like the Maple where the coloured foliage vanishes with the first puff of wind, it stays on and on. It is lovely in August, when the flowers are in bloom, and they are very free flowering plants, and make a pyramid of white. I always feel that this is a first-class plant. If you find it does well with you, you should plant a number of them. I admired this plant when a very young man. I raised a number from seed, I planted a lot when VEITCH'S great nursery closed and now we have ninety in our garden; it gives flowers and looks most lovely late in August and in the Autumn.

We also grow Gentians. Instead of having a little patch, I have grown a long bed of the European Alpine Gentian, *G. acaulis*, with a very great many plants in it, and they look most beautiful at this time of year. But as well as the Alpine Gentians, I grow the Chinese Gentian, *G. sino-ornata*, not quite as large as the European one, but having at least five times the number of flowers per square yard. They are a little more difficult to grow, but so much more free flowering. Near the *Gentian acaulis* we grow the golden-yellow *Primula Forrestii* (Fig. 146). It has a lovely scented flower and it is the only *Primula* which is a shrub, because in China it has shrubby stems three feet long.

Fig. 145 shows one of the most recent *Primulas*, I believe it received an Award of Merit to-day, *Primula eburnea*; I think it had previously died out; with these *Primulas* from the Far East, unless they seed very well so that you can always be renewing them, they are rather disappointing plants, because they will not readily stand our climate out-of-doors, though some of our Scottish friends are more successful than we are in England and Wales.

Among the greenhouse plants are *Clivias* (Fig. 147); they are mostly orange, but we also have one we call 'Bodnant Yellow' which is a hybrid with a yellow one; they are very beautiful, they take well and last a long time, and they have up to 25 flowers in a truss; they are one of our best greenhouse plants. By throwing away the poor ones and always growing the best, you are able to get a gradual advance which brings them to a still higher point of perfection.

Osmanthus Delavayi (Fig. 142) is one of WILSON's introductions, a sweet-scented shrub, and it was put against the wall because we thought when it was introduced that it was not hardy, but it has proved quite hardy.

There is one of our hybrids, *Rhododendron* 'Cilpinense' (Fig. 144); they are quite hardy, they are freer flowering than either parent, they make a lovely picture in the dell, and when they are in flower they are a real ornament to the garden.

The photograph (Fig. 150) shows *Camellia Williamsii*, a hybrid between *C. saluenensis* and *C. japonica*, one of the best shrubs ever introduced to our gardens. It is very free flowering, and gives five or six times as many flowers to the square yard—if one may put it that way—as the ordinary *Camellia*. They are a pale pink, and they have this great advantage, when the flower is over it buries its own dead. I know what a bother the ordinary *Camellia* is, the dead flowers stay on and unless you have time to pick them off, they stay there; these bury themselves.

Fig. 148 is *Magnolia denudata*, one of the best of all the *Magnolias*. We have a view of that from the house all round on that side; it is a lovely thing, but of course if a frost comes all these beautiful flowers are reduced to a brown pulp. How freely it flowers and what a dazzling white it is. People taking up gardening should begin with that, and take care that they get a true *denudata* and not one of those hybrids; it flowers young.

Among the *Magnolias* we have *Magnolia Dawsoniana*; it is pink and the flowers droop a little, but they are very large; it is one of the new ones from China introduced in 1900 (Fig. 149).

There is another one, *M. Sargentiana robusta* (Fig. 131). It has flowers like gramophone trumpets, 8 to 9 inches across; they begin by being upright, after a little time they turn over and hang down, and to stand under a tree where there are pink hanging trumpets by the hundred looking down on you is an unforgettable privilege. It is a wonderful tree, but it has one disadvantage, it is that all the available stock has been bought up. In the close-up (Fig. 152) you can see the trumpet-like flower, it looks white, but it is suffused with pink.

• That is the end of the slides taken by our good friends of *Country Life* and the Royal Horticultural Society. We are very grateful to them for allowing the use of those slides and for putting them at our disposal; the photography is beautiful.

Now we will have the coloured slides which are of individual *Rhododendrons* which have been produced by the courtesy of my American friends. I hope the day will come when we will have an album of coloured photographs and can look at them; at present we must be content to see them through the lantern, where they are much better shown than if they were on sheets, but it requires more elaboration to show them.

There is one thing I should like to impress upon people, and that is that with these gardens where we have had a first-class plant, we have grown a lot of them, such as the *Eucryphias*, *Magnolias*, *Gentians*, and the *Rhododendrons*. Now we are trying to get *Embothrium* in quantity which is one of the most lovely flowering shrubs. I think if one had a

number of these great scarlet pillars all flowering at the beginning of June, it would add greatly to the beauty of the garden. Therefore, in the last few years I have been planting a great number of them from the seed of our best variety, a hardy one—it had a First Class Certificate at a recent Flower Show—and also from their off-sets, because if you worry the roots a little bit by making little nicks in them, they will send up little shoots.

It always appeared to me that when one has a real first-class plant that does well in the garden one should try and plant a good number of it. This was done not only with Rhododendrons and Magnolias, but with Eucryphias, especially the deciduous species with its lovely Autumn colours, and with Gentians and Thalictrums.

In later years a great deal of hybridizing work was done not only with Rhododendrons (of which an account was published in the *Rhododendron Year Book* for 1948), but with greenhouse plants, such as Amaryllis, Clivias, Streptocarpus. Certain hybrids were also made with hardy plants.

A Member. Would the Lecturer tell us whether Embbothrium is hardy, does it depend upon how far south you live?

Lord Aberconway. We sent a man over, MR. HAROLD COMBER, the son of our old friend MR. J. COMBER, who worked so long in Sussex, and we told him to go to the places where these would be hardy, as high as possible and as far south as possible. The best one he got came from the Norquiquo Valley where the flowers are massed together.

A Member. Are they rapid growers?

Lord Aberconway. They grow very very fast, these plants of COMBER's do not seem to be affected by frost at all, and they flower fairly young.

I may say that while the greenhouses where experimental work is done are retained by me, the garden itself has been made over to the National Trust with an endowment sufficient to keep the garden in its present state, because I felt that having given a great number of years of my life to the work of building up the garden, I should like it to be more or less permanent, and I should like it to be there for succeeding generations of people to look at. The arrangement is that they allow me to manage it, as I understand it, and I hope my son will continue to manage it after me.

Of course in arranging this garden and keeping it good, one has been very much helped by a very skilled staff; MR. F. C. PUDDLE has worked there for a very great number of years and is a most skilled cultivator. When I have given him a plant and said "I like that," he has always done well with it, and if it is possible he has grown it, and his son, who has succeeded him, has the same green fingers as his father. We have houses used for propagating, and if I say I would like more of this plant, and I ask what has happened to it a year or eighteen months later, he will say "I have eight or ten cuttings that have rooted," and there they are in little pots. That is a very great help. Of course the National Trust have the first call on anything I propagate in the gardens, and secondly my friends. One gets all these things for the garden to keep it up to date as it has always been in the old days. (Applause.)

The Chairman. I am sure we have all enjoyed ourselves very much—I know I have. It has been both instructive and entertaining and we could not be more grateful to LORD ABERCONWAY for sparing all this afternoon to tell us about Bodnant. He has not understated, but he has only told us about one-tenth of what he has in the gardens, I hope he will come along another day and tell us some more. (Applause.)

ORCHIDS FOR THE "WEEK-END GARDENER"

David F. Sander

(Lecture given on March 7, 1950, MR. GURNEY WILSON in the Chair)

I

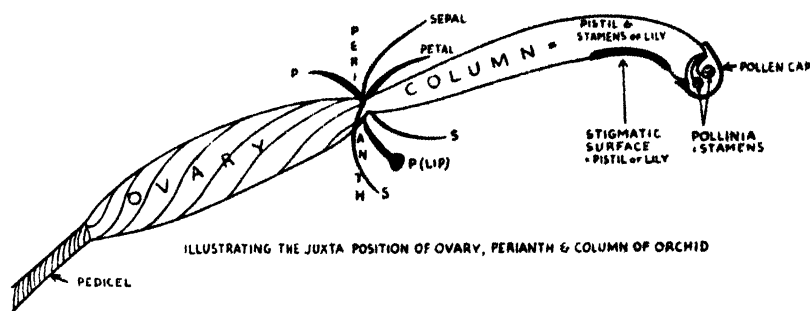
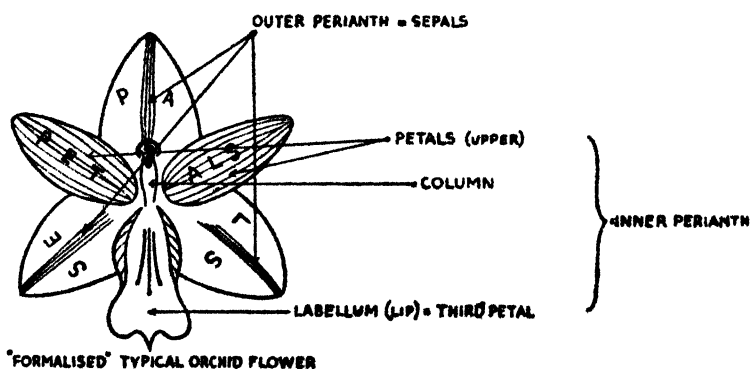
THE very word Orchid seems to spell inhibitions to the average gardener. You hear of Orchids being "Exotic"—a ridiculous word anyway where plants are concerned—"Expensive and difficult to grow."

I personally hate the word *exotic*. It conjures the unreal and unnatural. In fact, I suppose nine out of ten plants we cultivate to-day both out of doors and under glass, are not natives of this country. Would you call the Dahlia exotic?—a native of Mexico—or the Tomato? Orchids are no more exotic than the Plane trees in our London streets.

A few months ago, when describing one of his beautiful discoveries, KINGDON WARD, whose articles are so very readable, used the descriptive words, "Of an Orchidaceous Beauty." Now KINGDON WARD is a plantsman, above all else, and, you must admit, a man of proved expediency. Did he use the word exotic? No, but he spoke simply of "orchidaceous beauty." What did he mean by these two words? Surely that the subject had a distinct shape, a unique charm, a definite stamp. Without decrying in any way such decorative showy flowers as the popular Dahlia, the lovely Rose, or the symmetrical Carnation, it must be admitted there are not many forms in any one of these genera. The colours vary, but NOT the floral form. In fact, they are uniform. True you have the pom-pom type, the Cactus, the single and what I call "Mop-Heads" in Dahlias, but they are all very alike—a mass of curly or straight segments hinged at the centre—one hundred? two—or three hundred? I have never counted them. It is not so with the Orchid. There are over 15,000 species in nearly 500 main genera; nearly 18,000 hybrids represented by certainly not less than five million plants the world over, and yet scarcely two alike! Except for vegetative propagations—there can be little chance of two identical blooms, although some species and hybrids show much uniformity within their one specific denomination—for example: *Cattleya labiata*, or *Laelia autumnalis*.

Before getting on to the real point of my talk to you this afternoon, let me say a few words on the Orchid flower. There is a close affinity between the Orchid and the Lily, but do not take my description as scientifically or botanically exact. As in the Lily, we find six major segments in two perianths. The outer three are sepals, and these protect the vital reproductive organs of the flower (when it is in bud) within

the more delicate petals, three in number, of the inner perianth. The three sepals remain in nearly all Orchids equal in shape and size, although sometimes connate, but this is not so with the petals. Two petals have a habit in many species of becoming obsolete or nearly so, though not of course in the *Cattleya* or *Cypripedium*, two of the best known flowers, where their contribution to the floral beauty is considerable. In every Orchid—and the following is perhaps why they are so easily recognized by everyone—the third and uppermost petal (here I say uppermost with scientific authority) is most intricately evolved into a distinct “landing platform” for that particular insect nature has decided shall fecundate that particular flower. This labellum, or lip, the third petal, may be gaudily coloured, bossed, hairy, or fimbriated heavily. It may be motile as in *Bulbophyllums*, and even sensitive to the faintest whisp of air as in *Bulbophyllum tremulum*. It may be developed into a quick acting trap, as in *Masdevallia muscosa*, or even a bucket-like contraption as in *Coryanthes macrantha*. There is tremendous diversity in this labellum. Nature’s use of coloured marks and ridges invariably leads the eye to the centre of balance of the lip, the “landing platform,” and up and along it into the most exciting centre of the flower, under the column. The column represents in one thickened rostellum, the pistil and pollen anthers of the Lily, and is usually long and curved, with the pollen under a well constructed cap at its very tip. Just below the pollen cap is a hollowed stigmatic surface, the pistil of the Orchid, which is glutinous in all species I know, bar the *Cypripedium*, where the pollen itself is viscid, instead of a hard dry sacklike bag of grains.



The Labellum in the perfectly opened flower is always lowermost, having turned with a torsion of the ovary—peculiar to all Orchids bar two or three—through 180° , in the latter stage of bud development. Before quitting "the flower" I will dwell once more on "orchidaceous charm." What more exciting picture in nature can you conjure to mind than the following.

Imagine a flower so designed:—

Coryanthes macrantha. The lip is thick, fleshy, wax-like in texture and curiously constructed,—without an illustration it is difficult to understand from description. A short stalk is produced from the base of the column inclined upward and outwards, the wing-like sepals and petals being inclined in the opposite direction, this short stalk ends in a cup or hood-like process, which at right angles gives rise to a second stalk or column-like process, which expands into another, much larger cup or bucket so shaped and placed as to catch a liquid secreted by two short horns or knobs at the base of the column. The flowers are strongly odorous and insects are attracted both by the scent and the tissue under the hood. In their endeavours to reach that they fall into the bucket and in their struggle to escape from the flowers, remove the pollinia. The process is somewhat similar in *Cypripediums* though the shape of the lip in that genus compels the insect without the aid of any liquid.

Such flowers alone, evolved or otherwise conceived are, I often think, in themselves a shattering proof of the synonymy of what we call Nature and a living, all-controlling, and very much *seen* God.

II

A hundred and one years ago, April 14, 1849, a correspondent wrote to the *Gardeners' Chronicle* as follows:—

"I suspect that the time is not far distant when we shall have many of the more easily cultivated Orchids (*Dendrobium nobile* for instance) the *Cypripediums* etc., etc., going about in the baskets of the itinerant flower sellers in London, and as easily grown as *Cactus speciosissimus*, etc. I am rather amused at the way in which Carnation growing is spoken of; I suspect even now that there are many who could make a decent show of Orchids, who would be very much puzzled to produce a good stand of Carnations. The fact is that there is even yet as much of empiricism in the growing of Orchids, as there used to be among the growers of Carnations, Auriculas, etc. I believe that we shall soon find keeping the more easily cultivation Orchids reasonably damp, and well exposed to light and air whilst growing, and giving them a good rest, will make this class as common as they are beautiful."

Why does this man of vision appear to have been incorrect in his forecast? I believe for a two-fold reason. First of all, until the Great War of '14-'18 the very wealthy, landed families and industrialists alone could afford collections, but more important, I feel, was the factor of prejudice. Those horticulturists who made a profession of Orchids encouraged high prices, and discouraged the over-popularizing of Orchids. The reason for this healthy forecast not being realized until this present era, was certainly not the "Difficulties of Culture!" "Most" Orchids are

as easily grown as Geraniums—just *different* in culture. In fact, a Geranium will wilt and die if deprived of water for a month, but most pseudobulbed Orchids will survive many months without water. I think no further proof is needed of the ease with which most may be grown than, for example, the existence in many countries of hundreds of thousands of *Cypripedium insigne Sanderæ*, all—please note, *all* vegetative propagations of one solitary plant, the albino *insigne* first flowered at St. Albans in 1888.

You may ask me: is the Orchid in fact, really popular to-day? Well, the proof lies perhaps in the number of commercial growers and dealers—some twelve in England alone, of which six are large firms. Their exports total over half the whole of the horticultural exports from the U.K. In the States, over 4,000 individuals subscribe to the *American Monthly Orchid Journal*. At a guess, I should say, the world over, between ten and twelve thousand amateurs grow Orchids! Alas, in this country, the late war, the heating problem, and above all the excessive taxation has indeed reduced the numbers of Orchid enthusiasts to a few hundred only.

Can an ordinary gardening enthusiast make a hobby of Orchid-growing? By ordinary, I mean one who, whether wealthy or in a more average income group, has to work from Monday to Friday, and even Saturday morning.

Yes, he most certainly can grow Orchids, and many do.

III

REQUIREMENTS

There are three essential factors to be considered before an amateur can hope to grow Orchids:—

- (1) Suitable greenhouse accommodation;
- (2) Adequate heating, and lastly, but the most important;
- (3) He, or she, must love plants and have an aptitude towards understanding them, whether Orchids, or broad beans—for every plant has certain distinct qualities and demands a certain culture. These three factors I want to deal with in greater detail.

Any existing conservatory, pit or deep frame, vinery or greenhouse can prove suitable with slight adaptations. It is essential that the glass be in good order, and the house draught proof. Wood and concrete and porous bricks are the best materials. Metal is, to my mind, to be avoided. It causes too great extremes of temperature in too short a period, and so strains the stomata of the plant's leaves. Shading is essential as also a rainwater reservoir, as you must not water with hard or adulterated water.

Ventilators too, are necessary where the house is large—say over 1,000 cubic feet volume.

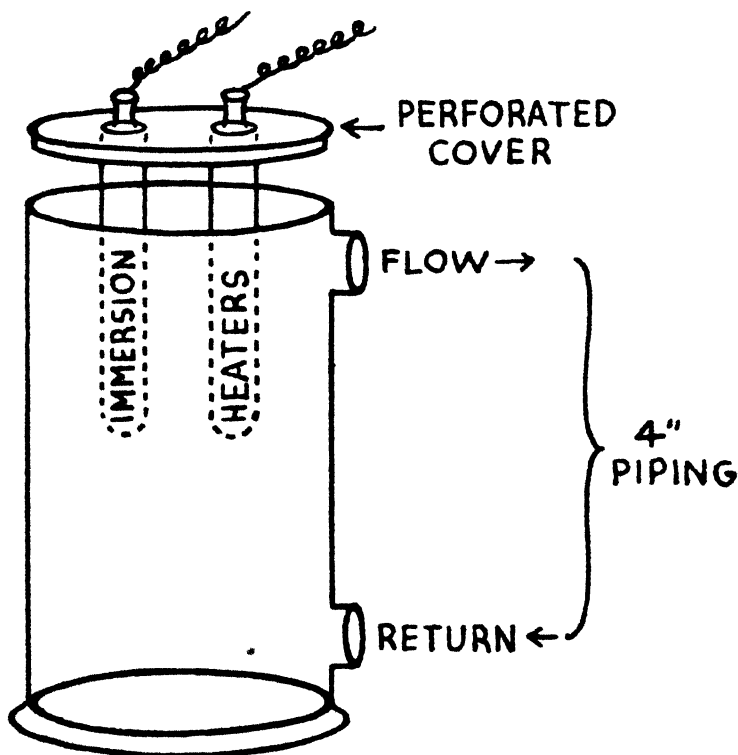
Another essential is a “dummy” or understaging, in the form of a tray 12 inches or so below the true staging, and this should be covered with some porous material such as coke, or even sand and gravel, to retain and give off moisture.

An open ground base is preferable to a concrete floor, as this ensures a sweeter atmosphere.

Piping should be the maximum possible to give off a greater volume of heat at a lower temperature, rather than a minimum of "red-hot" piping. Now, I realise this must dash the hopes of many potential growers of Orchids, but it remains a fact that oil-burners and electric radiators are generally not successful. If you must burn oil—take the fumes up to the glass by elongating the flue, and *cut the wicks every day whether blackened or not*. Use twice as many heaters for a given sized greenhouse than the makers advertise, and then rely only on 45° Fahr. minimum—enough for Cool House Orchids anyway.

Electricity is really a perfect medium—specially for the "week-end" grower. It is only the cost which makes me suggest an "Ideal," or small slow-combustion water boiler, the better proposition, especially where it can be built to heat a living room as well. The great advantage of electricity is that it can be automatically and thermostatically controlled—until of course, the Power House decides to do the controlling for you! Because of "cuts" potential and because the hot water system is ideal, I would recommend every time an "immersion-heater" system. You will readily understand that the volume of water in such a system—or even in electric radiators—will not chill off suddenly, though here

TYPICAL EXPANSION BOX CONVERTED FOR IMMERSION HEATING

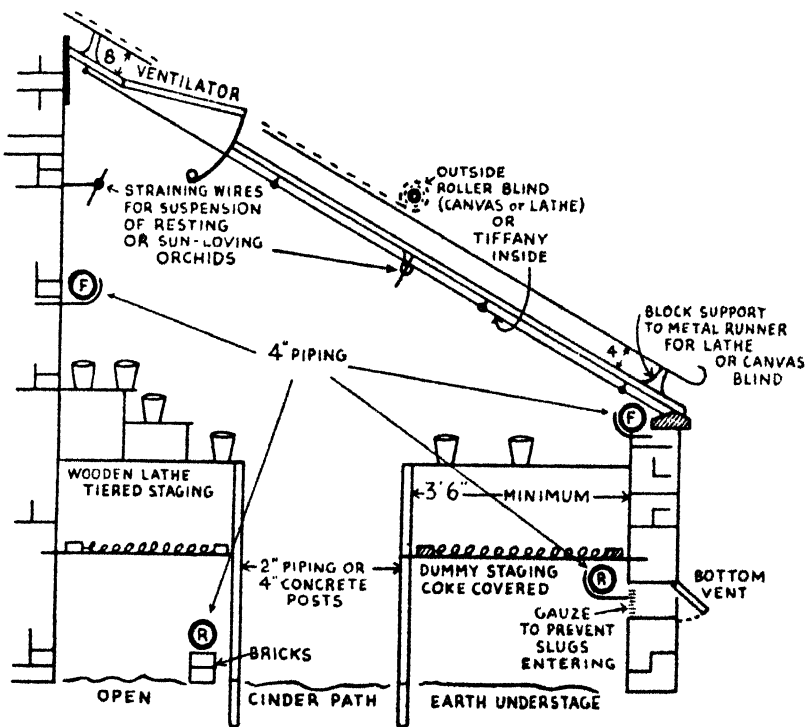


again ample "wattage" is essential—*i.e.* several heating elements—to ensure quick compensation after "cuts," or ice-cold rain or snow, or an east wind, or perhaps a pane or two broken unexpectedly at night.

Before illustrating a typical feasible greenhouse conversion, I will endeavour to explain what I mean by an aptitude to understand plants. You may all know the rules about pruning—this by the way is against myself—but I do not. Except for my ramblers, which I prune and tie when time permits in the Autumn, I cut in a most unprofessional way all my Roses on March 17 or the nearest Saturday! and my Roses flower wonderfully. I think it is because I love them, and although I have been told many times to prune bushes *hard*, I very rarely do so. I like to prune each Rose as an individual. So it is with Orchids and the potting and watering of them. The man who can read the open message that an Orchid spells in its leaves, bulbs, surrounding compost, general perkiness or lack thereof, can water correctly.

The man who must tap the pot and measure the thickness of a leaf to the nearest thou. has a very long way to go! Not that even *he*, with perseverance cannot learn to grow them.

I have drawn a sketch of a lean-to ridgeboard 10/12 feet high, in order to illustrate the "Must-Haves" of Orchid houses.



TYPICAL VINERY OR PEACH HOUSE. CONVERTED FOR ORCHIDS

(Illustration stressing)

- (a) Top and bottom air-vents 30×12 inches and 15×10 inches minimum respectively.

- (b) 4-inch ample piping *over* bottom vents, below staging unless max. height of "header-over-boiler system" is used, when one or two pipes are overhead, either under the eaves, or the apex, where a lean-to house is concerned.
- (c) Rain water tank near hot pipe.
- (e) Dummy-staging of clinkers for "damping down."
- (f) Hard water supply for damping.
- (g) Blinds—wooden outside 6 inches off glass, or tiffany inside—plus "summer-cloud."

IV

WEEK-END GROWING AND IN BETWEEN

Now to my final and main point—"Weekend Growing." If fifty-five men can look after 120,000 Orchids—as with a commercial firm I have in mind—and MR. HILLS of Exbury, and his successor MR. BARTLETT to-day, does indeed tend between 1,800 and 2,000 *mature* Orchids, you can reckon that, given only a couple or three hours weekends and the odd ten minutes morning and night in week days, an amateur can grow *well* some 150–200 Orchids in his spare time. This is how he can do it, and enjoy every moment.

GENERAL CULTURE

Atmosphere. Aim at a congenial atmosphere—*i.e.* one in which a human being is comfortable—then you will rarely go wrong. This is done by relating the atmospheric humidity to the warmth available, and if this is well done a weekly check up with the water can is sufficient.

Shading. Shade the glass adequately from March to September inclusive. I suggest you stipple the glass on the South or South-west side and South, or South-west gable-end as from the first weekend in March, and wash it off in the last week of August or the beginning of September, according to the longevity of the summer. Add increased shading by the use of blinds—tiffany under the glass; or wooden lathes, or canvas roller blinds, on the outside—when the sun begins to burn warmly at the end of March or early April, when most Orchids will be well in growth. It is these young growths you must protect.

Watering. Only water once a week those that need water and never allow a plant to remain sodden. Orchids revel in water and air alternately, the air being pushed easily through a well-rooted and well-potted plant by each successive watering. Allow for pseudo (false) bulbs: a *Cattleya*, for example, even when growing, will stand drought more than a *Cypripedium*. This is obvious when you consider the hard large food storage bulbs of the former and the lack of all bulbs on the latter, the *Cypripedium*. Coriaceous leaves will also resist drought more than soft fleshy, or thin leaves.

Visit a Nursery. The best way to learn about culture is by visiting a commercial grower. You will pick up more in a short day than by reading volumes of books on culture.

Potting. Potting too, however well explained, must be physically illustrated, to obtain perfection—the general principle being firmness, homogeneity, and a vertical strata of compost over the well-crooked,

well-drained base. Always pot when the plant is about to root, or is in new growth. Begin with *Cypripediums* after flowering in February, and end up, if possible, with *Cymbidiums* in May.

Odontoglossums are best potted in September, and many of the *Cattleya* group (*Epidendrae*) will require late summer potting. So you will readily see that an odd week-end of serious potting in February, March, April, May and August and September, should see you through the most arduous but interesting of necessitous jobs.

WEEKDAYS

Mornings. Having always atmospheric conditions in mind, and a thought for the weather forecast, damp down the dummy stages and flooring, except on the coldest days, after you have checked up on the boiler. When in winter months the boiler situation is not favourable, for example, out, or likely to burn very slowly until noon, then avoid damping down. This is only a five to ten minutes' job. Let the blinds down if you leave as late as 8.30, or get your wife to do so. Ask her to damp down (*if she is willing!*) before lunch, but this can be dispensed with, although on the hottest summer days, it is very beneficial. You would let the blinds down—assuming you have lathe or roller blinds—when snow or cold sleet or a bitter east wind is anticipated, which cool the glass, and by conduction the atmosphere beneath, so very much.

Evenings. Check on your boiler again when you return and before turning in at night. In the Spring and Summer, draw up the blinds an hour or so before sundown. Damp down if you are back before seven, and there are a couple of hours before sundown. In the winter months, there is little you can do after mid-day. From late spring to early autumn open the top ventilators slightly and allow the cool evening air in. Bottom ventilators can be opened safely in the late spring and early autumn evenings.

WEEKENDS

When you feel like it—and *do* try to “feel like it!”—in the spring (March and April) and autumn (Sept. and Oct.) spend an odd hour in the greenhouse and/or potting shed. Such jobs as (a) checking on disease or pests; (b) potting; (c) moving plants about; (d) tying up necessitous spikes; (e) manuring; (f) labelling notes; (g) cutting off back bulbs, etc., can then be done, and prove of a great interest both anticipatory and preventative. Let me amplify these points.

(a) Watch specially for thrips and red-spider. Both are minute but leave unmistakable markings, and are usually to be found on the younger growths. They thrive in arid atmospheres. Red-spider, by the way, can only be satisfactorily controlled by a nicotine and soap solution. Dip the plants in a weak solution of 20 per cent. Wettable D.D.T. twice a year, in the spring and early autumn, repeating a second time at 10–14 days interval to catch the hatched eggs not killed by the first dosing. Sponge the leaves after dipping with a soft lemon-oil, if one of the scales is involved, and brush down into the bracts and rhizomes where scale so often is concealed.



Colour transparent F. L. Dorey, 1914

THE GARDENS AT BODNANT

Fig. 131. *Magnolia Sargentiana robusta* (See p. 267)

THE GARDENS AT
BODNANT

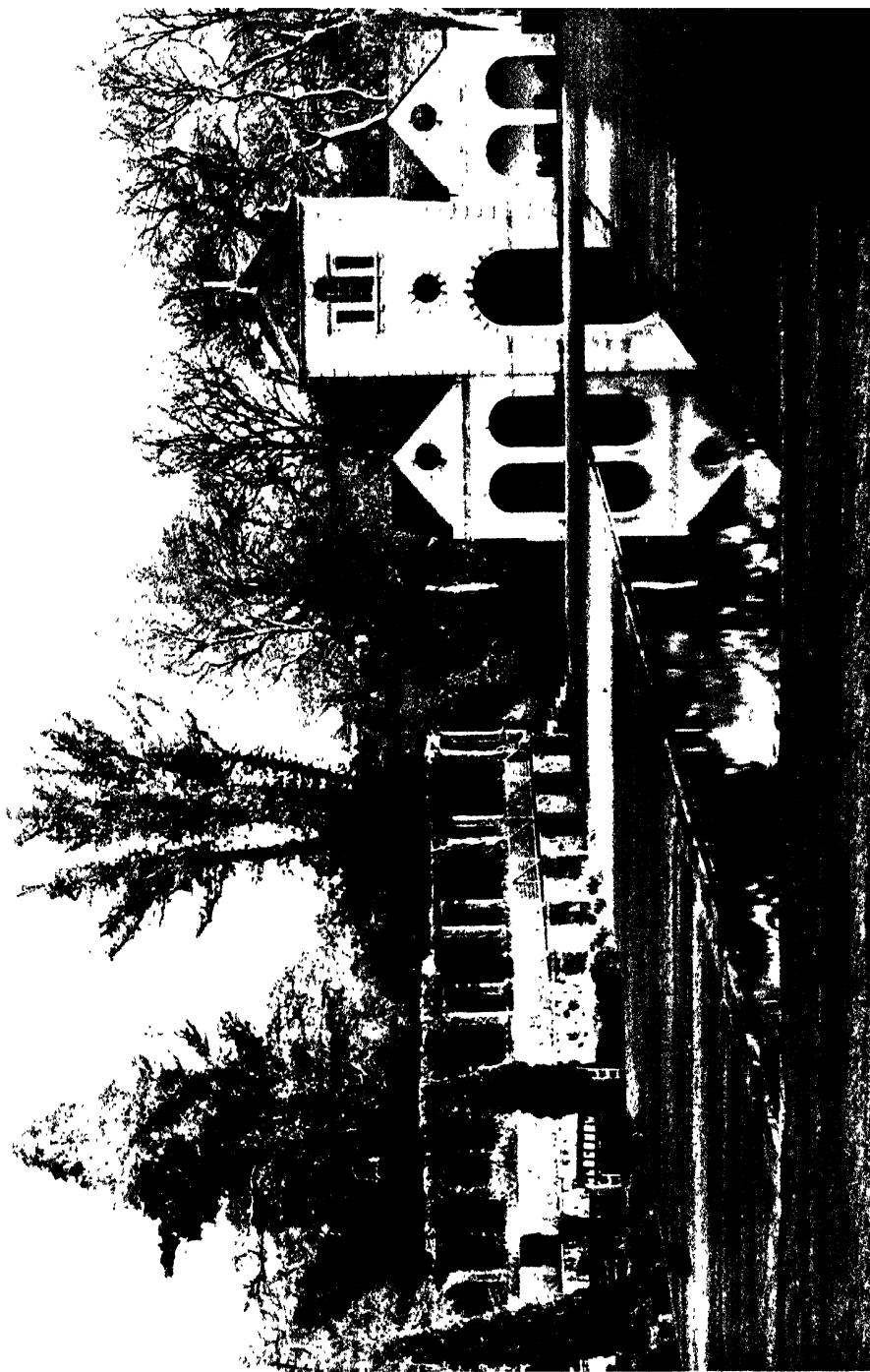
Fig. 132.—The view from
the house with the River
Mersey and the Snowdon
range (See p. 264)



Photo, J. E. Dwyer

THE GARDENS AT
BODNANT

Fig. 133 — The Canal
erace and Pin Mill
See p. 264)





Photo, Country Life

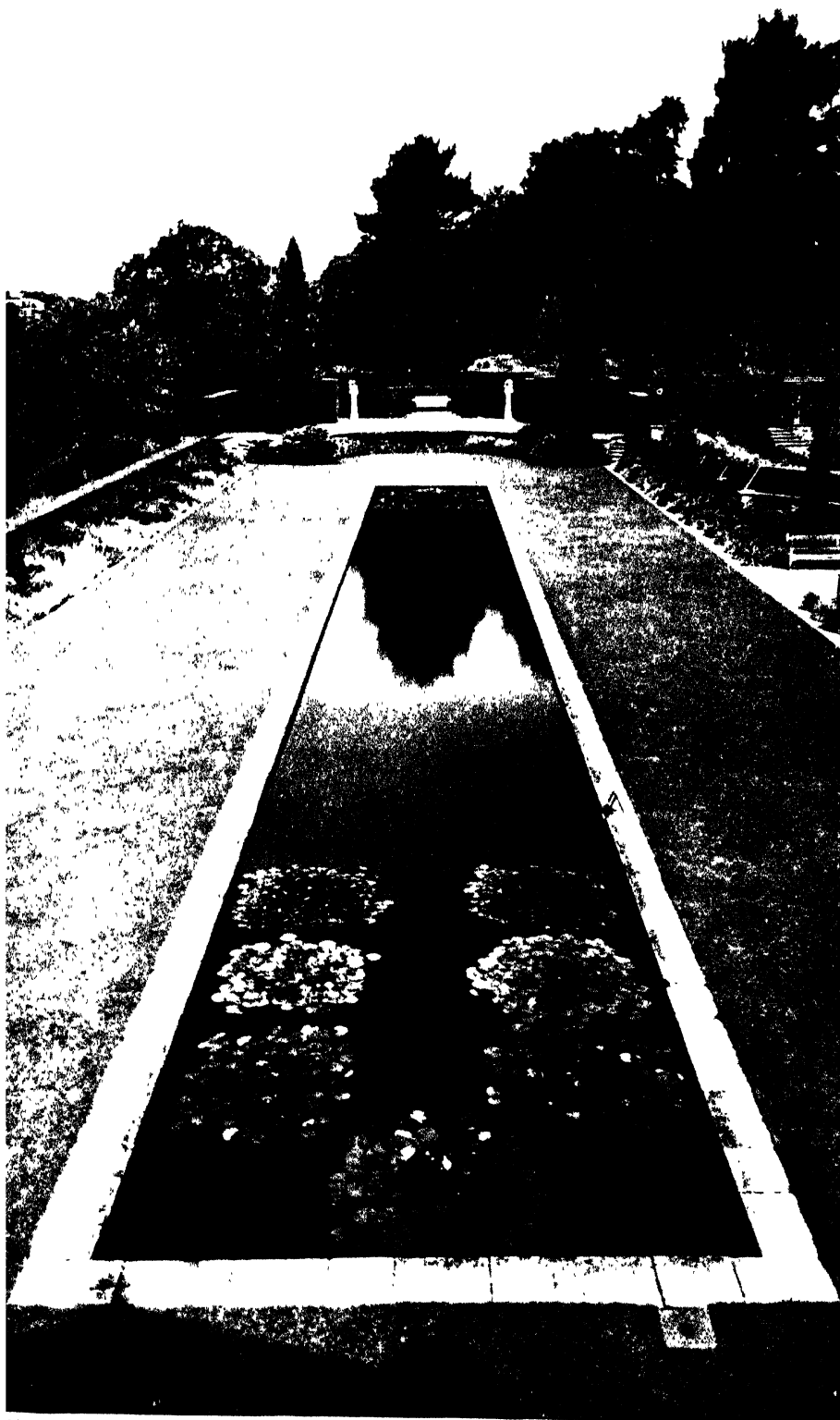
Fig. 134 The stage with seat (See p. 264)

THE GARDENS AT BODNANT

Fig. 135—View of the Canal terrace from under the archway of the Pin Mill

Photo, J. E. Downward





Photo, Country Life

THE GARDENS AT BODNANT

Fig. 136 - View looking towards the stage and seat (See p. 264)

THE GARDENS
AT BODNANT
fig. 137—Trees in the
well (See p. 265)



Photo. J. E. Devereux

THE GARDENS
AT BODNANT
g. 138—The Dell
(See p. 265)





Fig. 139—Narcissus 'Princeps' in the grass (See p. 295)

THE GARDENS AT BODNANT

Fig. 140—Water Lilies in the pond on the Terrace (See p. 295)





Fig. 141 *Helleborus corsicus* (See p. 266)

THE GARDENS AT BODNANT

Fig. 142 *Osmorhiza Delavayi* (See p. 267)





Fig. 143—*Magnolia denudata*
THE GARDENS AT BODNANT

Fig. 144—*Rhododendron 'Cilpinense'* (See p. 267)

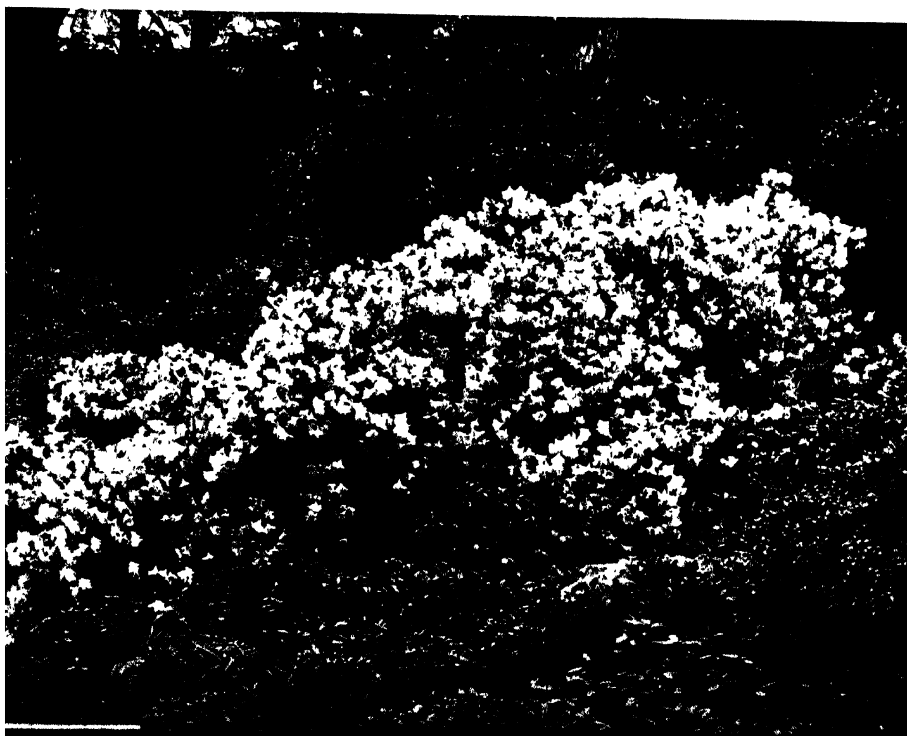




Fig 145 *Primula churica* (See p. 266)

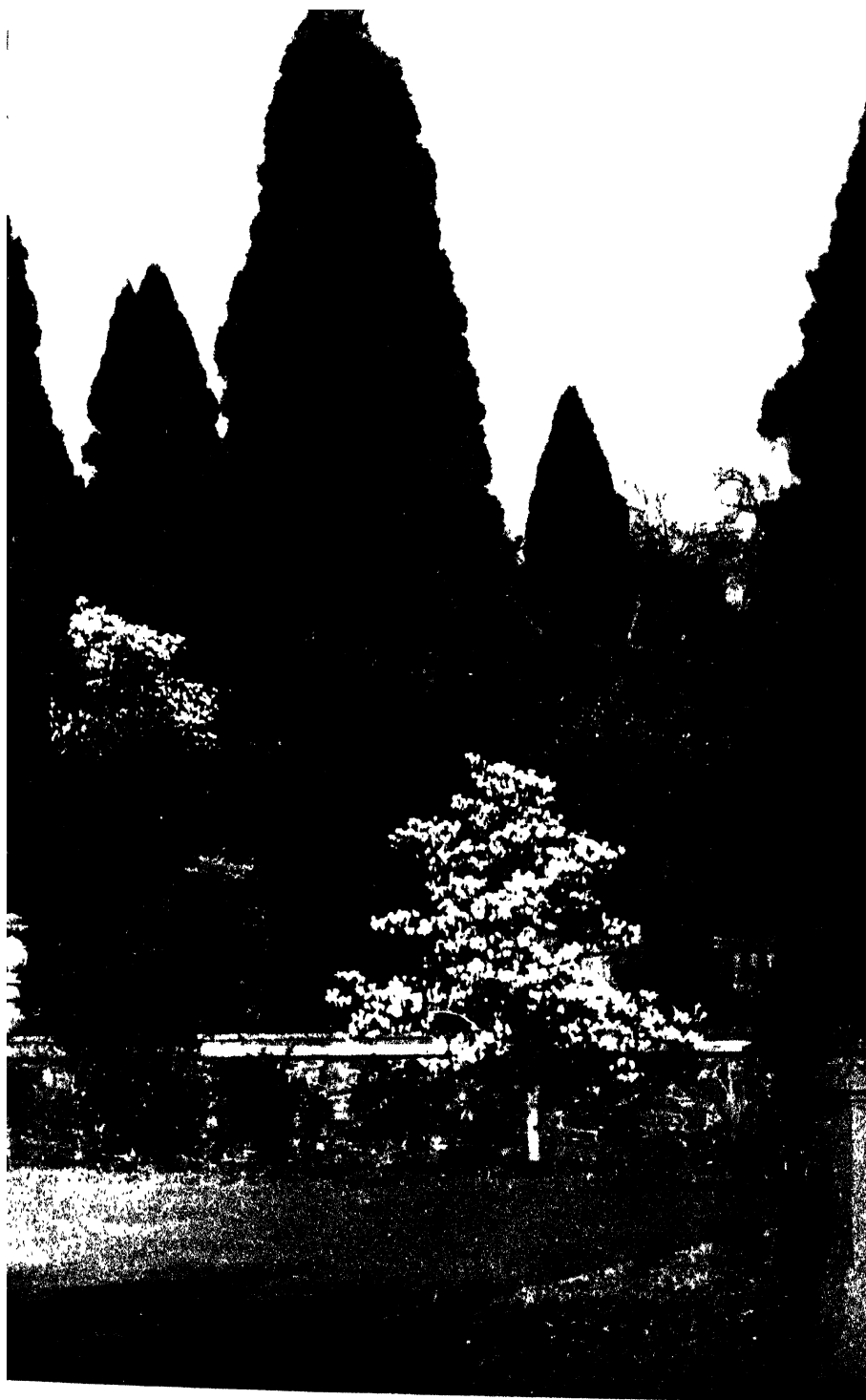


Fig 146—*Primula Forrestii* (See p.

THE GARDENS AT BODNANT

Fig 147—A group of Chivias in the Conservatory (See p. 266)





THE GARDENS AT BODNANT
Fig. 148—*Magnolia denudata* (See p. 267)



THE GARDENS AT BODNANT

Fig. 149 - *Magnolia Davidsoniana* (See p. 267)



THE GARDENS AT BODNANT
Fig. 150—*Camellia* × *Williamsii* (See p. 267)



ORCHIDS FOR THE WEEK-END GARDENER

Fig. 151—Part of a group of *Cymbidiums* shown recently at Vincent Square



THE GARDENS AT BODNANT

Fig. 152—The flowers of *Magnolia Sargentiana robusta* (See p. 267)

(b) Pot as suggested earlier in these notes when the growth is well away at such a time as to ensure the new roots penetrate comfortably into the fresh compost.

(c) A matured bulb denotes the approach of a rest, however short, to harden the plant and ensure flowers. With epiphytes this can be assisted by dodging a plant to a drier corner, or suspending it under the glass. One plant is bound to finish up its growth first. Move it if you think it will do better, or if it has been recalcitrant with its flower spike the previous year.

(d) I hate sticks and raffia, but where a spike is in danger of breaking, a gentle tie will help, and sometimes improve the curve of the inflorescence, by directing it towards the front of the plant, or the path. Cypripediums, for example, somehow look silly unless the flower stem is vertically erect.

(e) Never manure *a plant*. Any manure spread on the dummy staging, or ground, will greatly invigorate growth. A pleasant form to handle is soot and lime thrown over the ground; this gives off ammonia, and smells most pleasantly sweet.

(f) Labelling your plants can be fun. A shorthand mark denoting date of flowering, potting, or size, for example, or when divided or whence acquired, is of great interest for future reference.

(g) If a plant is ill-furnished at the back, or is in your opinion very fine and worth propagating, or even if you perhaps have promised a piece to some friend, then cut cleanly the rhizome between the back-most bulb (or two) and the next succeeding bulb. In nine cases out of ten you will get an adventitious growth to come. The best time to do this is from December first to end of February, if possible a month or two before the new leading growths would begin.

SUMMER HOLIDAYS?

I fear there is truthfully no answer to this most awkward of questions! You simply should not take them—or indeed want them if you are bitten by the "Orchid Bug"—unless perchance your neighbour can be relied on for two ten-minute periods a day! Actually, having seen so many Orchids survive the war in incredibly adverse conditions, I might hazard the information that you need not *worry* unduly about holidays. In fact, when I dwell on this tricky point, and consider my four children, and the dozens of ways any one of them could suffer a fatal accident in my little acre of garden, I wonder, given a child is worth more than Orchid, and that an Orchid has a guardian angel (a premise I fear not many will be unable to accept!) whether the risk is great? Up to a fortnight I should say "No." But you would have to leave the blinds down, and saturate and seal the house up, having dipped every plant in a bucket the eve of your leave! Quite seriously, and here I speak without my tongue in my cheek, if there ever were a living plant other than the Cactus, that was patient of *incredibly* (sometimes) *bad* treatment, surely you have it in the Orchid! With this in mind, and reducing my thoughts to complete and impartial objectivity, I would suggest the following dozen Cool House Orchids (minimum winter night temperature 45°–50° F.) as ideal for a beginner to test his green-fingers on and safely leave

for a fortnight in August. They will flower from September through to May, and require artificial heating only from September to April inclusive.

Odontoglossum grande, bold yellow chestnut blotched large flowers.

Laelia anceps or *autumnalis*, the nearest approach to a *Cattleya* in the cool-house section, 3- to 4-inch flowers of typical Orchid mauve.

Dendrobium nobile or hybrid, a beautiful 3-inch buttonhole Orchid, very free, amethyst and purple.

Odontoglossum Cervantesii or *Rossi majus*, both equally delicate beauties, white marked with rust, from Guatemala.

Oncidium varicosum, from Brazil, the 'Ballet Girl' Orchid, with a "myriad-spike" of small ($1\frac{1}{2}$ -inch) canary-yellow flowers.

Cypripedium insigne, from Sylhet, N. India, the common 'Slipper' Orchid.

Cypripedium insigne Sanderæ, the lovely yellow (albino) form.

A *Cypripedium* hybrid of a modern form.

Cymbidium Tracyanum and *Lowianum*, the former rich red-brown and scented, September flowering, the latter green with red lips on long arching racemes in May.

A *Cymbidium* hybrid of a modern form.

And last, but not least, *Coelogyne cristata*, an old friend of February, with grape-like masses of bulbs, and lovely white flowers with a gold ridge on the lip.

SOME CHILEAN PLANTS CULTIVATED IN BRITAIN

G. W. Robinson

PART IV

SCROPHULARIACEAE is well represented. Calceolarias are extremely diverse and include both shrubs and herbs. Amongst the latter are plants suitable for Rock Garden, border and bog. I remember finding no fewer than eight species in a square mile, the two most common being *C. integrifolia* and *C. pratensis*. *C. integrifolia* is probably the best known of the taller species; it has been in cultivation over a century and has been figured several times both in the *Bot. Mag.* and *Bot. Reg.* Whether it is distinct from *C. rugosa* is a matter for the botanist to decide but there is obviously a good deal of variation. We have two distinct types in cultivation, both of which I have; one has short broad foliage while the leaves of the other are relatively long and narrow, the latter being in my experience the hardier. The earliest figure is *Bot. Mag.* t. 774 in 1823 and another figure in the same work is t. 1083 called var. *angustifolia*. This is very like the plant previously mentioned; it was collected by MCRAE in 1825 in both the Valparaíso and Concepción districts. Another erect woody plant with similar habit is *C. thyrsiflora*; it has narrow foliage and close compact heads of flowers. This was first flowered in 1828 in Edinburgh (*Bot. Mag.* t. 2915).

Completely different in habit, *C. pratensis* is herbaceous, with the rosette growth of a Plantain, and almost as common, in Central Chile,

as the latter in Britain. It bears a large number of strong inflorescences about a foot high, each bearing scores of bright yellow flowers. *C. crenatiflora* is closely allied and similar in habit, with yellow flowers marked with red. It was introduced from Chiloe in 1831, figured in *Bot. Mag.* t. 3255, and reintroduced by MR. COMBER. Neither of these are reliably hardy but the latter at least is still in cultivation. *C. biflora* is smaller and one of the hardiest. The stems are rarely more than 3 or 4 inches in height, each bearing two vivid-yellow pouches. It prefers a cool shady corner and seems indifferent to lime. It was given the Award of Merit in June 1929. Flourishing under similar conditions and equally tough is *C. acutifolia*; it is a well-known Rock Garden plant from Patagonia and S. Chile, with dark yellow flowers more or less spotted (*Bot. Mag.* t. 9278). *C. corymbosa* is more like *pratense* in habit with very large corymbs of golden flowers. There is a very fine figure in *Bot. Mag.* t. 2418 in 1823.

Another species which is usually grown as a tender annual is *C. scabiosifolia*, a fleshy vigorous perennial. It is found in ditches and moist woodland, where its strong inflorescences reach 3 or 4 feet high. The flowers are rather a dull yellow with a hint of orange, and reddish brown calyxes and peduncles. There is a good figure in *Bot. Mag.* t. 2405 drawn so early as 1823. I have many times marked the name in lists, but have usually received the much more common *C. mexicana*.

The most striking species of all is *C. Darwinii* from the extreme south of the continent. It is most frequently treated as an Alpine house plant grown in pans, but it does well with some growers in the open; a year-old plant is capable of producing scores of its large brown and yellow, white banded pouches. It was given the Award of Merit in 1928, when shown by SIR WILLIAM LAWRENCE from seed collected by MR. ELLIOTT.

C. Fothergilli is similar, and, in my experience, much more liable to die off in the winter owing to the fact that it is more hairy. SWEET gives the date of introduction so early as 1777 but it still remains an uncommon plant. Both are figured in *Flora antarctica*. The pygmy of the genus is *C. tenella*. It is a perfectly prostrate grower, creeping by means of slender stems and rooting as it travels. From the axils of tiny rounded leaves, it sends up thread-like stems 2 inches high bearing perfect little golden slippers with brown spots. It is best in a sunny but not too dry situation. It was collected for VEITCHES by DOWNTON so long ago as 1873 and there is a rather poor figure in the *Bot. Mag.* t. 6231. Two species with purple flowers have, in skilful hands at Merton, played a considerable part in modern hybrid races. They are *C. arachnoidea* and *C. purpurea*. *C. arachnoidea* reintroduced by MESSRS. ELLIOTT and BALFOUR GOURLAY is still in cultivation; it has greyish woolly foliage and small dull purple slippers (*Bot. Mag.* t. 2874). *C. purpurea* is similar and was introduced about the same time, 1826 (*Bot. Mag.* t. 2775). *C. picta*, which was also found and introduced by MESSRS. ELLIOTT and GOURLAY from the northern province of Coquimbo, is an attractive plant but was not hardy and is probably lost. *C. violacea* is an evergreen sub-shrub but can only be grown out of doors in the most favoured parts of Britain. It is, however, an interesting cool greenhouse plant with helmet-

like, lavender, purple spotted, flowers. It was, at one time, separated from *Calceolaria* under the name *Jovellana*. Introduced in 1853 it was figured three years later in the *Bot. Mag.* t. 4929. It is a plant of the "wet" area chiefly, but is found so far north as Concepcion.

Ourisia elegans, better known as *O. coccinea*, is a delightful plant where it does well, though that is by no means everywhere. The best I have seen have been in Scotland and I am told it is also good in Ireland. Two things it must have to be successful—sunshine, and moisture at the root. It carries its brilliant scarlet flowers on 9-inch stalks and continues to flower from early summer to autumn. It spreads by means of fleshy rhizomes and forms mats of bright green foliage. Collected by PEARCE in 1862 the plant was wrongly determined as *O. coccinea*. It was widely grown and figured in the *Bot. Mag.* t. 5335 under this name. It was not until MR. COMBER collected the true *O. coccinea* in 1927 that the error was discovered. True *O. coccinea* differs in its rosette habit and the fact that it does not produce rhizomes. It was given the Award of Merit in May 1928 when shown by COL. MESSEL but I question whether it is now in cultivation. PEARCE introduced, from the same expedition (1859–1866), a closely allied species which was named in his honour *O. Pearcei*. This also has tubular crimson flowers, but it does not appear to be in cultivation. Gesneriaceae are represented by three distinct, interesting, and beautiful plants. *Asteranthera ovata* is a native of the Chilean Lake district and grows in thick woodland as an epiphyte. It bears some resemblance to the related *Columnea* and has similar soft red tubular flowers some 2 inches in length, nestling in a carpet of deep green ovate leaves. Probably the best known plant in cultivation is that at Nymans where it is grown on the north side of a brick wall; here it has reached 9 feet in height by 21 feet wide. It is perfectly happy in the Southern counties in such a situation but in colder localities would be safer in a cold house or fernery. It was shown at the Royal Horticultural Society's Hall in 1939 by COL. STEPHENSON CLARKE (*Bot. Mag.* N.S. t. 15). *Mitraria coccinea*, the Mitre flower, is more shrubby in habit and will reach 5 or 6 feet high under favourable conditions. It also can be grown trained on a north wall. A good specimen is a lovely sight, the scarlet flowers and yellow stamens stand out well against the dark glossy green foliage. MR. COMBER has had it out of doors for twenty-five years in a moist half-shady situation; in cold districts, however, a conservatory or cold house is necessary. It was introduced by LOBB for VEITCHES and has proved an excellent plant in the S.-Western counties. *Sarmienta repens* I have not seen for some years though, at one time, I grew it suspended on rafts in the same manner as cool-house Orchids, and under the same cool moist conditions. It is a forest plant, epiphytic in habit, and comes from the region between Concepcion and Valdivia. It has crimson flowers, large in proportion to the plant. It was given an F.C.C. in 1863 when shown by MESSRS. VEITCH and there is an excellent life-like plate of it in the *Bot. Mag.* t. 6720.

Eccremocarpus scaber is one of a family of beautiful climbers, the Bignoniaceae. Though naturally a perennial it is generally grown as an annual either for conservatory or greenhouse decoration or raised under glass and planted out in spring where it can be grown successfully out

of doors it is always strongest in its second year. A rapid grower, it reaches 10 or 12 feet in height, and is at its best in August and September. It has light graceful pinnatifid foliage and the orange flowers are an inch or so long and borne in profusion. It has been cultivated well over a century and is still sometimes listed under its synonym *Calam-pelis scaber* (*Bot. Mag.* t. 6408 and *Bot. Reg.* 939). The yellow flowered form was found in Chile by the late MR. DENNIS SQUIRES of Valparaiso. He gave me seed which I forwarded to Kew under the delusion that it was a new species.

Argylia canescens is a curious plant. It has a perennial succulent stem, and sends up from this, annual crops of flowers and foliage. The flowers are golden yellow with a red throat and the leaves are palmate in outline but pinnatifid and graceful. It is tender and only suitable for cool-house cultivation. It was received at Kew in 1892.

Stenandrium dulce is an interesting little member of the Acanthaceae which flourishes in hot dry situations. It has compact inflorescences only a few inches high with pink flowers rather spoiled by the persistent bracts which are so common in this family. It has been in cultivation but does not do well. It does not appear to have been figured.

Verbenaceae are well represented in S. America. The 'Lemon-scented Verbena' *Aloysia* or *Lippia citriodora* was at one time an extremely popular plant. Specimens in tubs were grown to a ripe old age and huge proportions, and wintered with the Oranges and Agapanthus in protected structures of some kind. To-day it is sometimes seen on warm walls or in cottagers' windows but is for the most part a neglected plant. Verbenas are common in Chile and three of them have come into cultivation in recent years. Two of these are likely to become popular Rock Garden plants as they are small, perfectly hardy, and interesting, shrubs. *V. tridens* collected by MR. ELLIOTT in Patagonia makes a 3-foot bush with dark, almost black, leathery foliage; the plant is covered in late summer with small fragrant lilac flowers. *V. thymifolia* we owe to MR. COMBER (No. 957). It is similar both in habit and flower to *V. tridens* but is dwarfer, more prostrate, and less straggling. Both can be seen in perfect condition in Edinburgh Botanic Garden where they are extremely happy. The third is a very different type, a somewhat coarse-growing herbaceous plant more suited to the bog garden, or damp border. This is *V. corymbosa*, a plant with dense corymbs of dark bluish violet flowers, which was introduced by MESSRS. ELLIOTT and GOURLAY under No. 354. It received the Award of Merit in 1929 (*Bot. Mag.* t. 9361). One of the commonest species in Central Chile is *V. erinoides* a tufted herbaceous plant 6 inches high, and prostrate in habit, with lilac or rose-pink inflorescences. It has been introduced many times and has undoubtedly played a big part in the race of garden hybrids. *Rhaphithamnus cyanocarpus* (syn. *Citharexylon*) is most common in the wet district of Valdivia. It is a prickly evergreen shrub reaching 20 feet in height. It bears masses of small lilac flowers in early summer, followed by the bright blue fruits which are its most attractive feature. It was first exhibited by VEITCHES in 1899, but most of the stock now in our gardens is from MR. COMBER'S No. 563. Though rarely killed, it is frequently cut hard back by frost and is better with some protection, in

most parts of Britain (*Bot. Mag.* t. 6849). *Diostea juncea* is a curious deciduous shrub some 10 or 12 feet high, while defoliated it resembles the Spanish Broom. It produces masses of pale lilac flowers in June.

Sphacele campanulata, a member of the Labiateae, is an interesting and attractive shrub up to 6 feet high in Chile, with campanulate blue flowers of varying shades. A native of Central Chile it is not hardy enough for general cultivation. It was reintroduced by MESSRS. ELLIOTT and GOURLAY in 1929. The plant figured in the *Bot. Reg.* t. 1382, was collected by MCRAE near Valparaiso in 1825, but was said to have been in cultivation twenty years earlier. This particular plant was almost white.

Phytolaccaceae is not a common family in cultivation but *Ercilla volubilis* is sometimes grown as a wall evergreen. Introduced in 1840 by THOMAS BRIDGES it was, in fact, named in his honour *Bridgesia spicata*. The flowers are dull pink or purplish and not attractive, though produced in quantity. They have no corolla but five oval sepals. The plant has aerial roots which enable it to cling to a wall, but if not pruned it develops such a mass of growth that the weight pulls it away.

One of my greatest disappointments in collecting was the failure to establish plants of the Chilean terrestrial Orchids. These were collected over several years and matured in garden soil. When dry they were packed in charcoal and dispatched to our Botanic Gardens. At Edinburgh they kept and flowered them for a number of years, but I think the fleshy roots do not get the ripening they are accustomed to at home, and they gradually deteriorate. They do not seem to have been tried much in the past, beautiful and interesting though they are. One of the commonest in the Central Provinces is *Chloraea longebracteata*, which is figured in the *Bot. Mag.* t. 7909 from roots received from the Consul General at Valparaiso, MR. J. W. WARBURTON, in 1903. In this and *C. multiflora* the colour scheme is white with dark green markings. *C. aurantiaca* and *C. disoides*, however, are orange and the former is almost as large as a Cymbidium. Several species were brought home by MR. ELWES in 1903 and flowered at Kew either that year or the following. One of the most interesting species from a botanical point of view is *Bipinnula mystacinica* in which the two lateral perianth segments are prolonged into hair-like fringes. Bromeliaceae is a typically S. American family. The giant of the family, a most striking plant, is *Puya chilensis*, syn. *P. coarctata*, 'El Cardon.' It makes huge masses up to 10 square yards with foliage 4 feet high and inflorescences up to 10 feet, the massive inflorescence being so much as 3 feet long by 1 foot across. The large greenish-yellow flowers are borne on horizontal branches, the tips of which are sterile and provide a convenient perch for the Chilean "Tordo" the small black bird which effects pollination. DR. FREDERIC JOHOW, writing of this bird in *Estudios de Biología Vegetal*, states that where the plant is abundant it is difficult to find a Tordo in spring which does not show in front of its head, which should be completely black, a large mantle of the most beautiful golden colour.

Owing to the formidable nature and the area covered by the plant, it is by no means popular with landowners and stockmen. Even the old dead leaves are persistent and protective. These, however, prove to be

the plant's weak spot, and during the winter, when there is least risk of extensive fires, these dry dead leaves are ignited and the plants destroyed. It has been cultivated in Botanic Gardens since 1820 and has flowered in the Scilly Isles (*Bot. Mag.* t. 4715). Though less imposing and somewhat smaller, *Puya coerulea* is certainly more attractive, having greyer, more arching foliage and blue-green flowers. *P. alpestris* is smaller again with grey rosettes and deep blue-green flowers. It was collected by MR. ELLIOTT at Concepcion in 1929 and brought back as living plants. It has been shown on several occasions and gained a Silver Lindley Medal in 1933 when shown by MAJOR DORRIEN SMITH of Tresco Abbey.

Rhodostachys bicolor, when flowering, is a conspicuous object on the trees in the region of Valdivia. Like so many of this family it is an epiphyte and under cultivation requires a spongy peaty compost and a damp situation; the exact opposite in fact of the requirements of *Puya*. The flowers in this species are violet and the inner ring of rosette leaves become scarlet during the flowering period, gradually returning to green afterwards. It was introduced by MR. COMBER under No. 1015 but I have not seen it recently. *R. pitcairniifolia* is one of the most exasperating of Chilean plants in that it will continue to flourish for years without even attempting to flower. It does, however, produce its flowers in Tresco and occasionally in Botanic Gardens under glass. The inner leaves then become red and show off the numerous small blue flowers (*Bot. Mag.* t. 8087). *R. andina* has longer arching and very spiny leaves, green on the upper surface but grey below. The inflorescence is much more conical in shape, and pink in colour, but the leaf rosette is not nearly so conspicuous as in the other two species. It was shown to the Royal Horticultural Society in 1851, and flowered at Kew in 1875 and again in 1889 when it was figured for the *Bot. Mag.* t. 7148. *Greigia sphacelata* was reintroduced by "SQUIRE" ELWES and is still grown in Botanic Gardens. Though it was collected so far south as Chiloe it does not seem to have proved very hardy. I have not seen it in flower, but it is recorded as having flowered at Kew in 1866.

The Chilean 'Crocus' *Tecophilaea cyanocrocus* is, at its best, one of the clearest and most intense of blue flowers, the gentian blue set off by a white throat. It is unfortunately very local in its distribution and very difficult to locate out of flower; the writer and others have tramped miles in unsuccessful attempts to locate it. Under cultivation it is usually treated as an alpine or cool-house plant, being dried off and rested in summer. That it has become established in some gardens is proved by the photograph in *New Flora and Sylva*, Vol. 4, which shows, hundreds of flowers out of doors. The date of introduction is given as 1872, though I have failed to check this or the collector. The variety *Leichtlini* is, I believe, still in cultivation; it differs in the larger white centre. The other species, *T. violaeiflora*, has a much wider distribution but is much inferior from a garden standpoint. It has small corms not unlike *Crocus* but they do not seem to live long in cultivation. It is of interest that in *T. cyanocrocus* the segments are regular and campanulate while in *violaeiflora* they are, as the name so aptly suggests, violet-like and set in a vertical plane. The family Haemodoraceae also includes one

of the commonest of Central Chilean wild flowers, *Conanthera biflora*. It is never more than a foot in height, the flowers usually being produced after the leaves have died off. It has open flowers of varying shades of blue and with the column of stamens projecting rather like those of the common Potato. The allied *C. Simsii* has a much more campanulate corolla—deep blue or purple in colour. The figure of *C. biflora* in *Bot. Mag.* t. 2496 is, I believe, this species.

Iridaceae is well represented in the Southern hemisphere. The largest Chilean genus is *Sisyrinchium* though it has never been popular in gardens. *S. striatum*, probably the best known, is amazingly prolific and the strongest grower of all. Its equitant foliage resembles an Iris and the flowers are cream and yellow. It is noted in AITON'S *Hortus Kewensis* as having been introduced in 1788, and it is figured in an early *Bot. Mag.* t. 701 and in MAUND'S *Botanic Garden* t. 17. This plant is one of the earliest to re-establish after a forest fire, and will cover acres in an incredibly short space of time. Allied to this species is *S. cuspidatum* which was introduced by MR. COMBER. Amongst other yellow flowering species which have been introduced are *S. graminifolium* (*Bot. Mag.* t. 3197 under the name *S. maculatum* and *Bot. Reg.* tt. 1067 and 1914) and *S. chilense*. This species has also a blue flowered form which is well figured in *Bot. Mag.* t. 2786, and still I believe in cultivation. One of the daintiest and widespread species is *S. junceum* (or *S. roseum*) with nodding pink flowers; it has, as the specific name suggests, rush-like foliage and stems. Introduced in 1832, it was figured in *Floral Cabinet* in 1839, and has many times been reintroduced and lost. It has a claw of tubers closely resembling the garden Ranunculi. Closely allied to *Sisyrinchium* is the yellow flowered *Solenomelus chilensis*, though I doubt if it is now in cultivation. A Brazilian plant, *Sisyrinchium convolutum*, is often sent out under this name but the two plants are very different. *Solenomelus chilensis* has zygomorphic flowers and carries them on a vertical plane like a yellow Violet. One of the most brilliant blue flowers I know, is *Calydorea speciosa*, a low-growing plant resembling a Crocus in habit and with flowers 2 inches across. It was in cultivation in 1863 and is figured in *Bot. Mag.* t. 3544. It is a common and lovely plant in Central Chile. *Symphystemon odoratissimus*, another allied plant, is a native of the Magellan region and was grown so long ago as 1828 when it was figured in the *Bot. Reg.* t. 1283. It was reintroduced by MESSRS. ELLIOTT and GOURLAY in 1928. *Libertia* is interesting in that it is represented in both Chile and New Zealand, the habit of growth being similar in both cases. Though the white flowers are small individually, the Chilean *L. formosa* is free flowering and attractive. It has been in cultivation since 1831 (*Bot. Mag.* t. 3294).

Amarylidaceae has many representatives, the best known being probably *Alstroemeria*. It is a lovely and diverse genus ranging from the fine forms of *haemantha* and *ligtu*, to dwarf plants like *peregrina*, *pulchra* and *pulchella*. They are extremely difficult from a taxonomic point of view, and I have never been able to draw a satisfactory line between *haemantha*, *chilensis* and *ligtu*. They certainly show a very wide range of variation within the species, and I believe cross freely. There

are a number of species not in cultivation though some have been introduced and lost. Many of them have been figured, though the names applied to some of the old figures are very doubtful. All the *haemantha* group require a warm sunny spot to be successful, though the rhizomes run deeply and usually escape frost. *A. aurantiaca* and its varieties are much hardier and can be grown in herbaceous borders, though they resent frequent transplanting. They can be extremely invasive, and are on the whole best grown by themselves. *A. violacea* received the Award of Merit when shown in 1945 by COL. STEPHENSON CLARKE; it is a lovely species and attracted a good deal of attention. It has recently been figured in the New Series of the *Bot. Mag.* t. 42. *A. aurea* is a pale yellow coloured plant from Chiloe, probably only a form of *aurantiaca*, though it is figured in the *Bot. Mag.* as a species t. 3350. The closely allied genus *Bomarea* is on the whole more tropical, but is represented in Chile by *B. salsilla* with umbels of crimson, and lilac, tubular flowers. There is little difference between the genera except the climbing habit of *Bomarea*.

Of the *Hippeastrums*, *H. pratense*, syn. *Habranthus pratensis*, is probably the best known. It was introduced so long ago as 1840, and gained the Award of Merit in May 1927. The hardiness of this plant is debatable. It has been recorded as flourishing in N. Scotland, in Ireland, and in many parts of England, yet it remains scarce and is at the moment unobtainable in the trade. It has small umbels of beautiful scarlet flowers, some 2 feet high. *Phycella ignea*, syn. *Hippeastrum bicolor*, is one of the earliest of spring flowers in the woods of Central Chile. Both its specific names are derived from the corolla, which is both bicoloured and fiery, in its scarlet and yellow. There is an excellent plate in the *Bot. Reg.* t. 809 dated 1824 as *Amaryllis ignea* but the *Bot. Mag.* plate t. 2687, a year earlier, does not do the plant justice. The plate t. 2399 under the name *Amaryllis cyrtanthoides* is probably a poor figure of the same species. *Amaryllis advena* is also well figured in *Bot. Reg.* t. 849 in 1824 in both pink and yellow forms and in the *Bot. Mag.* t. 1125. This is also a common species in Central Chile. Another allied plant has lovely flowers with long slender salmon-coloured perianth segments. Both these and other allied species flower before the leaves are fully developed. I reintroduced all these species in 1926, *P. ignea* being shown (as *Hippeastrum bicolor*) in November 1929, but I believe all are again lost.

The Lily family, in Chile as elsewhere, yields a number of interesting and decorative plants. Certainly one of the loveliest is *Lapageria rosea*. It is a plant of the wet districts of the Southern Provinces where it is a lovely sight intertwining amongst the branches and suspending its wax-like tubular rosy-scarlet flowers in mid-air. Their decorative value and interest are both greatly enhanced by the small green humming birds, or "Picaflores" which are the natural agent of pollination. These delightful little creatures remain poised below the flowers, stationary except for their wings which move so rapidly as to be scarcely visible. It is one of the few native plants which are really valued and cultivated in the Valparaíso and Santiago districts, though even there it is not too easy to establish owing to their drier and warmer conditions. Known

as the "Copihui" it is the national flower and huge bouquets are offered to travellers in the south, the children sometimes wading almost waist deep in water and swamp to obtain them. It has been in cultivation for almost a century, having been received by Kew in 1847 from RICHARD WHEELRIGHT. It had, however, been introduced to France some years previously, and was there named in honour of the EMPRESS JOSEPHINE, whose maiden name it bears. The equally lovely white variety was one of PEARCE's introductions in 1860. These and many spotted and mottled forms were at one time very extensively grown for greenhouse or conservatory decoration. Trained on wires, it is capable of covering quite an extensive area and it is of course seen to best advantage in that position. The flowers are too well known to require description but the fruit is less common. It is oblong or three-sided, about 2 inches long containing numerous seeds in pulp. These if sent intact keep the seed viable for a long period, but once they are opened the mucilage dries up and the period of viability is short.

As its habitat suggests, it requires ample moisture at the root and a peaty sandy soil. If a cool root run can be provided without lime infiltrating, it can be grown. It has many times been tried out of doors but in most parts of this country it is a gamble, and unless conditions are really favourable it is better under glass. *Philageria Veitchii*, an interesting bigeneric hybrid between *Lapageria* and *Philesia buxifolia*, is intermediate between the parents (*Bot. Mag.* N.S. t. 92). The name is of interest as it is reputed to be the original compound generic name. The two genera are closely related botanically, *Philesia buxifolia* being a dwarf slow-growing evergreen shrub a foot or so high and spreading by underground shoots. It has rigid glossy leaves tending to curl, especially under dry conditions. The flowers, crimson bells about 2 inches long, resemble those of *Lapageria* in colour and texture, but the flowering season is spread over summer and autumn, I personally never saw it flowering freely, even in Chile, nor do I remember seeing a compact bush there, such as I have frequently seen at the R.H.S. Hall. It has been in cultivation since 1847 having been introduced by LOBB. To do well out of doors it must have a moist and sheltered situation (dry conditions and cold winds are equally fatal), and above all a lime-free soil. I would describe it as a connoisseur's plant and have seen numerous and excellent pot-grown plants in cold or cool houses. That it can do well given favourable conditions is proved by the plant at Rowallane which in 1930 was recorded as 9 feet through (N.F. & S. July 1930).

Leucocoryne, though another member of the Liliaceae, is an entirely different type. It is in fact allied to the Alliums and Brodiaeas and the common wild type proclaims the fact when handled, by its odour. It is one of the commonest plants in the Central Provinces, and its various forms are as extensively picked and marketed as are Primroses in England. It was introduced in 1826 and figured in *Bot. Mag.* t. 2832 as *Brodiaea ixioides*. The variety *L. ixioides* var. *odorata*, the 'Glory of the Sun' introduced by MR. ELLIOTT in 1928 is free from the family taint, and as the varietal name suggests, is, in fact, pleasantly scented. It is vastly superior in every way and I need say no more than remind you that it has received both the A.M. and F.C.C. of the R.H.S., while a

group of flowers gained the Silver Lindley Medal for MR. ELLIOTT. There is a lovely plate in the *Bot. Mag.* t. 9457.

Pasithea coerulea, the "Pajaritos" (Little birds) of the markets, is another of the most typical and popular of Chilean flowers; it lasts well when cut, and is a good clear blue. It is a monotypic herbaceous perennial not unlike *Camassia*, with a root system resembling *Asparagus*: thin wiry roots swelling into watery storage tubers which of course make it extremely drought resistant. There is a figure in the *Bot. Mag.* (7249) dated August 1892 and from the text we learn that it was known and described so long ago as 1660. It has frequently been lost and reintroduced. I am afraid it is not winter hardy in the open; it is probably best grown in large pots and wintered in a cool or protected house. I was delighted to see it flowering in a Cotswold garden this summer. It is of interest to note that the vernacular name given in the *Bot. Mag.* "Espuella de Galan" (Gallant's spur) has now been transferred to *Tropaeolum majus*, and is also sometimes used for Larkspur.

Within a few days of my arrival in Valparaíso, I noticed a curious little green-flowered plant which puzzled me considerably; it had the habit of a *Sisyrinchium* but the structure suggested a *Liliaceae*. Years later and quite by accident, I came across a figure of it in the *Bot. Mag.* t. 2716. From this I learned that the plant was *Gilliesia graminea* and further (with some satisfaction) that the botanists of that day (1827) were equally puzzled, and that they finally decided that it must go into a Natural Order of its own, *Gilliesiaceae*. It is merely a botanical curiosity but a most interesting one.

Luzuriaga radicans is an interesting little plant with a habit suggesting *Polygonatum*. The white flowers, however, are more like those of *Solanum jasminoides* though the six perianth segments instead of five, give away its family. It is not an easy plant to cultivate and does best under cool moist greenhouse conditions. Its habitat, from Valdivia to the Magellan Straits, would suggest a greater degree of hardiness, but it is obviously a woodland plant. There is a figure in *Bot. Mag.* t. 6465.

Ephedra andina is extremely common in the Coastal belt of Central Chile. It is extremely drought resisting, forming compact hummocks, covered in season by the most lovely white or salmon-pink fleshy fruits. It is most disappointing in cultivation, I have had large specimens, in pots, planted out, and trained on walls, but I have not yet seen those lovely fruits in cultivation. In some areas in the South the native Bamboo or 'Coligue' forms an impenetrable jungle. Not content with spreading along the ground it climbs on to and over the other vegetation and smothers it. It is peculiar in that the stems are solid not, as in most of the family *Gramineae*, hollow. The Genus, *Chusquea* is cultivated in mild localities and was in fact shown to the Scientific Committee of the R.H.S. in 1946. Of the many and lovely Chilean Ferns few are now in cultivation in Britain. The hardiest is probably *Lomaria magellanica* which is grown in warm and sheltered situations in the southern counties. It has bold leathery fronds up to 4 feet in height. In the days when Ferns were largely cultivated under glass there were a considerable number grown. LYELL's *Handbook of Ferns* gives no fewer than 85 species from Chile.

There are probably quite a number of other plants which have come into cultivation and been lost. There is also little doubt that there are many more equally as lovely and interesting as those mentioned which have not been introduced. I certainly did not realise when I started to compile these notes what a considerable number are being or have been cultivated.

A PHYSIOLOGICAL BREAKDOWN IN TOMATOES CAUSED BY HIGH TEMPERATURES IN 1949

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TOMATOES showing an external discoloration and an internal necrosis, not hitherto observed in Ireland, were received by the writer on July 5, 1949, from a correspondent in County Donegal. These specimens, however, were only forerunners of the malady, and during the period July 7 to 20, numerous affected Tomatoes were forwarded from different parts of the country; sometimes as many as four separate lots coming to hand on the same day. Reports accompanying the specimens stated, that whilst the lowermost trusses were those chiefly involved, occasionally the trouble occurred higher up on the plants, and especially where the trusses were very exposed. Tomatoes in shaded houses were unblemished.

EXTERNAL APPEARANCE

Both green and partially ripe fruit showed large, glossy, blackish areas. These were indefinite in outline, not depressed on specimens first to hand but slightly sunken on later samples. The discoloured areas occurred mainly around the circumference of the fruit, and were rarely present on the stem-end. From an eighth to one-half of the Tomato surface was blotched in this manner, and usually every fruit on the truss was affected. The darkened patches resembled, to some extent, attacks by the Potato blight fungus (*Phytophthora infestans*). So strong was this resemblance many people diagnosed the trouble as due to attacks by the blight fungus, and in some cases spraying was actually contemplated by growers. Owing to the prevalence of the malady in the month of July, its superficial resemblance to blight attack, and the frequency with which it was being diagnosed as such, it was deemed expedient to issue a notice to Instructors in Horticulture drawing their attention to its occurrence and its distinguishing features.

Discoloration of the fruit was much worse than generally occurs with *Phytophthora infestans*, and the blackened areas much more glossy in appearance. It was obvious from a close examination that the cause of the darkening was situated in tissues beneath the surface. Separating walls of the loculi in Tomatoes frequently show up as faint lines, ridges

or furrows, and in quite a number of affected fruit the discoloration was most marked in such places, the underlying walls shining through as very dark streaks. Nearly all of the diseased specimens were green fruit. However, where ripening fruit had blackened patches, the latter often had whitish blotches along their margins. These pale blotches varied in appearance and texture from those of typical Blotchy Ripening to others with a completely white, paper-like skin, as occurs from Sun Scald.

INTERNAL SYMPTOMS

When cut, the blackish areas were found to be more or less necrotic. In some instances only a few scattered groups of cells were brown and dead, but in many cases the necrosis was severe. The axis of the fruit, whilst not free from dead cells, was least affected, and the collapse of the tissues was worst in the ovary wall and in the walls of the loculi, particularly where the last mentioned showed up externally as black streaks. Although splits and cavities up to half an inch or more in length occurred in the dead tissues, the necrosis seldom extended right to the surface but was covered with a layer of a few cells in depth which seemed normal. Apart from this feature, cut specimens presented an appearance not unlike that of Bitter Pit in Apples or of Sprain in Potatoes.

Microscopical examination and cultural work failed to reveal any organism in the damaged tissue.

CAUSE OF THE TROUBLE

It is the writer's opinion that this breakdown in Tomatoes was due to the extremely hot weather experienced in Ireland during the period June 18 to July 13. The malady appeared in glasshouses soon after the heat wave reached Donegal, and its subsequent appearance elsewhere coincided with the spread southwards of the very warm weather. Unfortunately, no records are available of actual temperatures in the glasshouses concerned, but at this time day temperatures in the shade were occasionally as high as 83°, 85° and 87° F. in various parts of the country. Under such conditions, where glasshouses were fully exposed in the sun, temperatures must have been considerably higher—probably around 100° F.

In glasshouses in the vicinity of Dublin this malady was rather common in the first fortnight of July. Records in the Botanic Garden, Glasnevin, show that during the period June 18 to July 13 inclusive, the average daily temperature in the shade was 69° F., with a mean of 50° F. at night. The maximum in the shade for these twenty-six days was 80° F. on June 26, and the same again on July 4: the minimum at night for these two dates was 51° F. and 54° F. respectively. Thus, not only were temperatures high during the daytime, but wide fluctuations of almost 30° F. occurred between day and night temperatures. With a return to much cooler conditions after the middle of July all further development of blackening and discoloration of immature fruit practically ceased. In some glasshouses, however, where the trouble had been severe, blotchy ripening was prevalent up to the middle of August.

It is of some interest to note that, coincident with the development of this breakdown of Tomatoes in glasshouses in Donegal, Heat Canker

of Flax appeared in Flax fields in the same county; and a little later, when discoloured, necrotic Tomatoes were being received from growers in the southern counties, severe Sun Scald and killing of Beech seedlings occurred in a Co. Waterford nursery.

DISCUSSION

Although necrosis in Tomato fruits is not uncommon, being an invariable accompaniment of virus diseases such as Aucuba Mosaic and Double-Virus Streak, the writer is not aware of anything in the literature on Tomato diseases corresponding exactly to that described in the present paper. The nearest approach to this breakdown is the necrosis which has been recorded as occurring in blotchy ripening, and it is in this relation that the trouble will be discussed.

Blotchy ripening of Tomatoes is a disorder in which the fruits ripen unevenly. Certain areas of the fruit-wall fail to develop colour normally. These areas are without any sharp line of demarcation. They are dark green at first, but usually they become more or less yellow as the remainder of the fruit ripens. In severe cases as ripening proceeds the blotched areas assume and retain a waxy or glassy appearance. The vascular bundles lying beneath these clear, glassy blotches appear to be brown or black and necrotic, a fact easily seen from the outside. The flesh under these discoloured patches is hard and somewhat tasteless.

As a result of investigations on blotchy ripening of Tomato fruits, BEWLEY and WHITE (1) concluded that this disorder is caused by malnutrition in respect of potash and nitrogen, particularly potash. However, they state that blotchy ripening could not be eliminated entirely by manurial treatment, as other factors, probably climatic in nature, play some part in the incidence of the disease. BEWLEY and WHITE (*loc. cit.*) found, that over a five-year period, the greatest development of blotchy ripening occurred during the months of June and July. These workers make no reference to immature fruit being affected, and presumably under their conditions only fruits nearing maturity showed symptoms of blotchy ripening.

SEATON and GRAY (2) state, "MACDOUGAL has shown by the use of an auxograph that the daily accretion in size of Tomato fruits is connected with temperature and water relations. As the temperature of the fruit attached to the plant rose from 12° or 14° to 26° or 28° C., the volume increased to a point where the increased temperature caused an excessive water loss by transpiration which overbalanced the gain by hydration." MACDOUGAL's data show that a water deficit may exist in the fruits because of excessive transpiration regardless of the moisture content of the soil. SEATON and GRAY's (*loc. cit.*) histological observations on blotchy ripening indicate that it is not a nutritional disorder arising from soil conditions. Their hypothesis is, that blotchy ripening is primarily due to conditions which result from the withdrawal of water from the fruits during periods of excessive transpiration two to five days before the fruit ripens. The same workers dissected and examined fruits in all stages of development for symptoms of blotchiness. They found the first evidences of blotchiness appearing only in fruit nearing maturity.

In glasshouses where the breakdown of immature Tomatoes early in July was afterwards followed by the appearance of blotchy ripening, the last mentioned could not in any instance be correlated with a lack of either potash or nitrogen. Furthermore, where ripening fruit had darkened areas simulating blight attack, the development of typical blotchy ripening along the margins of such areas was gradational. This indicated that one was only a lesser development of the other.

Much of the necrosis which accompanies blotchy ripening is associated with the interocular walls of the ovary. BEWLEY and WHITE (*loc. cit.*), SEATON and GRAY (*loc. cit.*). The latter workers have shown that it is mainly the thin-walled parenchyma adjacent to the vascular bundles which becomes necrotic. They suggest, that some physiological force is operative in bringing about the conditions antecedent to blotchy ripening. It is obvious that where fluctuations of almost 30° F. occur between day and night temperatures outside, temperatures inside glass-houses must vary accordingly. Under such conditions thin-walled parenchyma cells will be subjected to considerable tension and liable to collapse.

Despite the fact that there is no previous record of blotchy ripening being detected on immature fruit, the breakdown which occurred in Tomatoes in Ireland in 1949 is believed to have been only a very severe stage of this disorder. Whilst much worse than anything previously described for blotchy ripening, the necrosis was of the same type and involved identical tissues of the fruit. To what extent widely fluctuating temperatures contribute to such necrosis is still a debatable point.

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PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1950

BULBS AND CORMS

Muscari Tubergenianum A.M. April 18, 1950. The introduction of this hardy bulb to European gardens is claimed by Messrs. C. G. van Tubergen, Ltd. The firm reports that the first specimens were sent to them by Geo. Egger, who made a considerable collection of local plants from the mountains of North-Western Persia while working at the German consulate in Tabriz.

During the early spring the plant produces large spikes with a distinct, turquoise-blue inflorescence. The basal flowers open first and are followed by those at the apex while the central buds remain tightly closed. The foliage is large and fleshy with leaves up to $\frac{1}{2}$ inch broad. Although very little has been written about this species it has already

proved itself a good garden plant with the habit of strong growth and the ability to propagate itself quite freely. Exhibited by R. W. Wallace, Esq., V.M.H., The Old Gardens, Tunbridge Wells, Kent.

Narcissus 'Cargan' A.M. May 2, 1950. A well-formed yellow variety, classified by the exhibitor as belonging to Division 2a, with a flower about $3\frac{3}{4}$ inches in diameter well poised on an 18-inch stem. The perianth segments were Lemon Yellow (H.C.C. 4/1) and the corona was slightly darker (H.C.C. 4). Raised by Mr. Guy L. Wilson and shown by Mr. W. J. Dunlop, Dunrobin, Ballymena, N. Ireland.

Narcissus 'Contour' A.M. May 2, 1950. A refined well-balanced white trumpet variety with a flower about $4\frac{1}{2}$ inches in diameter, well poised on a stout 18-inch stem. The smooth perianth segments were broad and overlapping, the outer ones being $1\frac{7}{8}$ inches long and $2\frac{3}{8}$ inches broad. The trumpet was $1\frac{1}{8}$ inch long and about 2 inches in diameter at its reflexed and frilled margin. Raised and shown by Mr. Guy L. Wilson, The Knockan, Broughshane, Co. Antrim, N. Ireland.

Narcissus 'Virtue' A.M. May 2, 1950. A refined, medium-sized yellow Daffodil, classified by the exhibitor as belonging to Division 2a, with a flower about 4 inches in diameter, well poised on a 19-inch stem. The perianth segments were Aureolin Yellow (H.C.C. 3/1) and the corona was slightly darker (H.C.C. 3). Raised and shown by Mr. Guy L. Wilson.

ORCHIDS

Brassocattleya 'Juno' A.M. April 4, 1950. An elegant flower in which the sepals and petals are broadly formed. In colour delicate rose, the expansive labellum deep purple. The result of crossing *C. 'Titrianae'* with *Bc. 'Olympic.'* Raised and exhibited by H. W. B. Schroder, Esq., Englefield Green, Surrey.

Cymbidium 'Clare Armstrong' var. 'Sunrise' A.M. May 2, 1950. The tall spike bore eight large flowers, amber-yellow, the front lobe of the labellum spotted with crimson-red. The result of crossing *C. Alexanderi* with *C. 'Mirella'*. Raised and exhibited by Messrs. Armstrong & Brown, Tunbridge Wells.

Cymbidium 'Claudona' F.C.C. March 21, 1950. The tall spike bore thirteen large greenish flowers, an attractive feature being the labellum with much crimson-red spotting. The result of crossing *C. 'Claudette'* with *C. 'Cremona.'* Raised and exhibited by McBean's Orchids, Ltd., Cooksbridge.

Cymbidium 'Kairouan,' Exbury var. A.M. January 31, 1950. The plant carried two arching spikes with a total of seventeen well-formed flowers, light greenish-yellow with a pinkish labellum. Raised and exhibited by Edmund de Rothschild, Esq., Exbury, Hants, the parents being *C. 'Rosanna'* and *C. 'Adelma.'*

Cymbidium 'Louis Sander' var. 'Ulysses' A.M. March 21, 1950. This attractive hybrid bore a spike of six rose-pink flowers, the labellum effectively marked with crimson spots. The result of crossing *C. Alexanderi* with *C. 'Ceres.'* Raised and exhibited by Messrs. Sanders, St. Albans.

Cymbidium 'Mayfair' Castle Hill var. A.M. February 14, 1950. The spike carried six flowers, of a pleasing reddish colour, the

labellum having a crimson blotch on the front lobe. The result of crossing *C. 'Rosy Queen'* with *C. 'Edzell.'* Exhibited by Lt.-Col. the Hon. H. S. Tufton, Castle Hill, Englefield Green, Surrey.

Cymbidium 'Miretta' var. 'Memoria A. A. McBean' F.C.C. March 7, 1950. An unusually fine result, obtained by crossing *C. 'Mirabel'* with *C. 'Claudette.'* The spike bore seven large flowers, with broadly developed sepals of olive-green colour, the petals greenish, and the labellum bearing a crimson-red blotch on the front lobe. Raised and exhibited by McBean's Orchids, Ltd., Cooksbridge, Sussex.

Cymbidium 'Pearlette' A.M. March 21, 1950. The spike bore five well-formed flowers, soft cerise, the labellum spotted with red. Raised and exhibited by McBean's Orchids, Ltd., Cooksbridge, the parents being *C. 'Janette'* and *C. 'Pearl.'*

Cymbidium 'Princess Elizabeth' var. 'St. Andre' A.M. March 7, 1950. The tall spike bore twelve large flowers, blush-white, the labellum minutely spotted with reddish-pink. The result of crossing *C. Alexanderi* with *C. 'Princess Astrid.'* Exhibited by the Hon. H. S. Tufton, Castle Hill, Englefield Green.

Cymbidium 'Roszika' A.M. March 21, 1950. The spike bore seven large blush-coloured flowers, the broadly-expanded labellum spotted with pink. The result of crossing *C. 'Adriaco'* with *C. 'Rosanna.'* Raised and exhibited by Edmund de Rothschild, Esq., Exbury, Hants.

Cymbidium 'Verulam' Exbury var. A.M. January 10, 1950. The showy spike carried eighteen flowers, cream-coloured with a few reddish spots on the labellum. Raised and exhibited by Edmund de Rothschild, Esq., Exbury, Hants. The parents were *C. Alexanderi* and *C. Tracyanum.*

Cypripedium 'Desert Sun' var. 'Jenny Strauss' A.M. January 10, 1950. The dorsal sepal is light-greenish, the petals and labellum amber-yellow. Obtained by crossing *C. 'Golden Emblem'* with *C. 'Mrs. Geoffrey Webb.'* Exhibited by R. Strauss, Esq., Stonehurst, Ardingly, Sussex.

Cypripedium 'Failand' A.M. February 14, 1950. The large dorsal sepal is roundly formed and has a greenish base. The broad petals and labellum are yellowish with brown shading. The result of crossing *C. 'Ballet Girl'* with *C. 'Thebian.'* Exhibited by R. N. Palmer, Esq., Ashlands, Warmley, Bristol.

Cypripedium 'Socrates' A.M. January 10, 1950. This distinct hybrid between *C. 'Xantippe'* and *C. 'Constance Flory'* has a tall dorsal sepal which is white with a small green basal area; the petals are greenish and the labellum yellowish. Exhibited by H. W. B. Schroder, Esq., Dell Park, Englefield.

Cypripedium 'Vigilant' A.M. February 14, 1950. A distinct and charming flower. The large dorsal sepal is flushed with light rose, while the petals and labellum are greenish. Raised and exhibited by Messrs. Stuart Low & Co., Jarvis Brook, the parents were *C. 'Whitehall'* and *C. 'Beaufort.'*

Dendrobium 'Winifred Fortescue' A.M. March 21, 1950. A handsome hybrid, obtained by crossing *D. 'Gatton Monarch'* with *D.*

'Lady Colman.' The plant carried five large and well-formed flowers, mainly of rose-purple colour. Exhibited by R. Strauss, Esq., Stonehurst, Ardingly, Sussex.

Laeliocattleya 'Eva Robinson' var. 'Easter' A.M. April 4, 1950. A well-formed flower with erect petals, soft rose colour, the labellum rich purple. The result of crossing *Lc.* 'Ishtar' with *C.* 'Angus.' Raised and exhibited by Messrs. Black & Flory, Slough.

Laeliocattleya 'Mullion' var. 'Springtime' A.M. March 7, 1950. An elegant and very well-formed flower, in colour rosy mauve, the labellum crimson-purple, the throat area golden. Raised and exhibited by Messrs. Stuart Low & Co., Jarvis Brook, the parents being *C.* 'Atlantic' and *Lc.* 'Hyperion.'

Laeliocattleya 'New York' var. 'Atlantic' A.M. February 14, 1950. This showy hybrid bore five large flowers, the sepals and petals pure white, the labellum crimson-purple. The result of crossing *C.* 'Maggie Raphael' with *Lc.* 'Aconcagua.' Raised and exhibited by H. W. B. Schroder, Esq., Dell Park, Englefield Green, Surrey.

Odontioda 'Lita' var. 'Neon' A.M. April 4, 1950. The tall spike bore twelve flowers, all the segments unusually developed, deep rose colour blotched with scarlet-red. The result of crossing *Oda.* 'Marie Antoinette' with *Oda. Pittiae*. Raised and exhibited by Messrs. Charlesworth & Co., Haywards Heath.

Odontioda 'Lola' A.M. February 14, 1950. The spike bore eighteen medium-sized flowers, rose-coloured, heavily marked with scarlet-red. The parents were *Oda.* 'Sapphira' and *Oda.* 'Argia.' Raised and exhibited by Messrs. Charlesworth & Co., Haywards Heath.

Odontoglossum 'Elise' var. 'Gloria' A.M. April 4, 1950. This vigorous plant bore a couple of spikes with a total of fourteen well-formed flowers, golden-yellow, blotched and spotted with red-brown. The parents were *O.* 'Ascania' and *O. triumphans*. Raised and exhibited by Messrs. Charlesworth & Co., Haywards Heath.

Odontoglossum 'Jenny Strauss' A.M. January 31, 1950. The spike carried seven large and well-proportioned flowers, light rose ground heavily spotted and blotched with chocolate-red. The result of crossing *O. Perryanum* with *C.* 'Purple Emperor.' Exhibited by R. Strauss, Esq., Stonehurst, Ardingly, Sussex.

Sophrolaeliocattleya 'Trizac' var. 'Purple Queen' A.M. March 21, 1950. Flower of medium size, but of exceptional colour, being rich purple with a crimson over-tint. The result of crossing *C. Trianae* with *Slc.* 'Anzac.' Exhibited by Messrs. Armstrong & Brown, Tunbridge Wells.

Vuykstekeara 'Angela' var. 'Jasper' A.M. May 2, 1950. The outstanding character of this hybrid is the intense purplish crimson colour of all the segments. The result of crossing *Oda. Pittiae* with *Odtna.* 'Milly.' Raised and exhibited by Messrs. Charlesworth & Co., Haywards Heath.

BOOK NOTES

"Dictionary of Genetics." By Dr. R. L. Knight. Pp. xii × 183. Published by the Chronica Botanica Company, Waltham, Mass., U.S.A. (Wm. Dawson & Sons, London). \$4.50.

The numerous terms used in animal, human and plant genetics, as well as those used in cytology, evolution and plant and animal breeding are defined in this dictionary. It is a pioneer effort which was badly needed. Many terms not to be found in any dictionary are here defined, in a manner usually fully in agreement with current genetic usage. Minor errors occur, but no Library should be without it, and the individual seeking genetic knowledge will find it of considerable value.

M. B. CRANE

"Hedges for Farm and Garden." By J. L. Beddall. Pp. 1-360 with 83 plates and 36 diagrams. (Faber and Faber Ltd. 1950), 25s. net.

This very useful book has much to commend it as it has something of value for every person who has to do with the land, not only estate owners and their agents, farmers, gardeners and highway authorities, but every lover of the countryside, even though his or her interest is limited to an occasional Sunday hike.

The book is divided into three parts, The Farm Hedge, The Garden Hedge, and Miscellaneous. In the first part the author not only describes ordinary farm hedges and the oft time accompanying ditches, but modifications of the ordinary hedge such as the turf or turf and stone bush-topped banks of Devon and Cornwall, the walled enclosures of the Cotswolds and certain parts of the northern counties, shelter belts for orchards and hop gardens, and other pertinent objects. He discusses wire and post and rail fences, gates, stiles and many other subjects. He gives his readers full information on the formation of hedges and their future management, and warns them of the harmful weeds that are likely to appear. The cutting back and laying of old and overgrown hedges (an art that is fast dying out amongst country folk) is described, and many kinds of plants are suggested for the coarser types of hedge. In part two, garden hedges are as fully treated as are farm hedges in part one. Various types of hedge and hedge plants are described with full particulars as to their treatment. In addition to strong outer hedges, informal interior hedges and even bordering shrubs receive attention. In part three, pp. 223-342, such subjects as hedges and the law, overhanging branches and penetrating roots, hedgerow trees, pests and diseases and many other subjects are discussed, with a good deal of space devoted to descriptive lists of hedge plants for various soils and purposes, and the enumeration, with their characteristics, of a very long list of trees and shrubs useful for hedges. In connection with the last item the author might, with advantage, have limited his choice to the most noteworthy as the long list is likely to confuse people who have an indifferent knowledge of trees and shrubs, moreover, the cost of some of the plants would be much higher than is usually associated with the price of hedge plants. The book is completed by a glossary of terms used and a good index. After going through the book one is greatly impressed with the thoroughness of the author's work and is inclined to think that the title does not do justice to its scope.

W. DALLIMORE

"The Grape Vine in England." By Edward Hyams. 208 pp. 8vo. Illus. (The Bodley Head, London.) 16s.

That the Grape Vine can be grown in England in the open all know. That some varieties in favourable seasons will produce edible Grapes when grown on walls or pergolas some are aware. A few have turned outdoor Grapes into vinegar, and in the past wine has been made off and on in Great Britain from the time of the Romans until the present century. But there seems to have been no continuity about this in spite of records of success, though wine is a desired beverage. This book is a record of the past put in a very readable form and a confident plea for another effort towards grape growing in the open. It recounts personal experience over a short time and out of this and what has been learned by inquiry and observation abroad makes suggestions as to what could be done to produce both dessert and wine Grapes in suitable parts of England. The author may be too optimistic as to the quality of the wine that could be produced, as to the kindness of our average Summer and Autumn in the amount of heat and light from the sun, and as to the reward that will be given for the amount of labour, at its present high cost, that must be devoted to the cultivation if good results are to be obtained. He gives no convincing reason for the undoubted fact that many attempts have been made in the past and abandoned after a time. He gives much valuable advice to the future Grape grower and full directions for the making of wine

in those years when nature and cultural skill have combined to produce suitable Grapes, but his optimistic attitude is clearly evident from the following sentences which appear on p. 91 after dealing with the selection of a site for a vineyard: "I conclude that the vineyard should be planted on a slope facing south or south-east, so that it will be exposed to light and air but protected from the north and from the rainstorms of the west. I also conclude that if you have no such site you still plant a vineyard."

"The Science of Turf Cultivation." By R. P. Faulkner. 64 pp. 16 Illus. (Technical Press Ltd., Gloucester Road, Kingston, Surrey.) 7s. 6d.

The late Mr. Faulkner had a reputation as a practical gardener and groundsman. This book (originally published as a series of articles in a monthly magazine) represents an attempt to present the scientific background to a practical subject in popular form. Since Mr. Faulkner was not trained in science the book is something of an achievement, but the reader must beware of quite a number of rather inexact statements. Specific reference is made to two of these, viz., on page 38 (on superphosphate)—"the phosphorus is present as mono-calcic-phosphate and phosphoric acid," and on page 56, "the leather jacket . . . is the larva of . . . *Tipula oleracea*." The illustrations are not as clear as they might be, in particular some indication of the magnification of the seed pictures would have improved their value.

"Utility Garden for Home Needs." By A. G. L. Hellyer. Cr. 8vo. 152 pp. Illus. (Collingridge.) 6s.

This is a revised edition of *War-time Gardening for Home Needs*, a most useful little book published during the War. It deals not only with the culture of Vegetables and Fruit, but also with their preservation by bottling, drying and pickling. It has been brought up to date with recommendations of the latest varieties while new cultural techniques are described, both in the fields of pest control and in the use of the invaluable John Innes composts. This is a practical little book; the text is clear and easy to follow and it is supported by illustrations which seem to show clearly the points intended. It can be confidently recommended to those beginning gardening or taking over an allotment for the first time.

P. M. SYNGE

"Gardens and Gardening, 1950." Edited by F. A. Mercer and Roy Hay. Royal 8vo. 172 pp. Illus. (The Studio.) 15s.

It is pleasant to be able to welcome once again the *Studio Gardening Annual*, a publication which has unfortunately remained eclipsed during the war and recent post-war years. The emphasis this year is placed firmly on the needs of the smaller garden and especially on the merits of shrubs and small trees for the labour saving garden. Mr. James Comber writes on Rhododendrons, Mr. F. Hanger on Shrubs and Climbers for Walls, Mr. George M. Taylor on Roses and their development during the past half-century, while the Fruit Garden is dealt with by Dr. H. B. S. Montgomery of East Malling under the title "Modernising the Fruit Garden." Mr. J. M. S. Potter gives much useful advice on the choice of dessert Apples for a succession of fruit. The construction and repair of lawns is described by Mr. R. B. Dawson, the Director of the St. Ives Research Station. Mr. C. H. Curtis writes on early flowering Chrysanthemums, a group of plants in which great advances have been made in recent years, Mr. T. Hay roams the world with his usual stimulating charm in search of choice hardy border plants and describes their introduction in an article of great interest. All the articles are authoritative and all contain sound practical advice which should make the volume helpful to many gardeners. It is lavishly illustrated in sepia gravure, which is a pleasant medium but in this case much of the finer detail seems to have been lost in a uniformly softening process. In this respect probably half-tone is a more satisfactory process for the reproduction of photographs of plants than is gravure, although the latter is probably the more suitable for reproductions of paintings. I also deprecate very strongly the habit of cutting the edges of photographs on the slant as in the one of *Clematis Armandii* and the page of *Melittis* and *Phlox maculata*.

P. M. SYNGE

"Vegetable and Flower Growing." By Marion Huntbach. Demy 8vo. 87 pp. Illus. (S.P.B.A. Supplies, Ltd., Wigton House, St. John Street, London, E.C.1.) 6s.

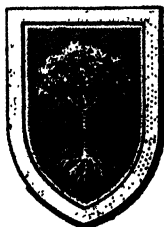
This little book is intended for the beginner in Horticulture and deals chiefly with vegetable growing, although there is a short section on the Flower Garden. Inevitably only a very brief and sketchy outline can be given in the space of 87 pages, but within these limits this little book appears to be practical and useful.

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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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Part 8



August 1950

THE SECRETARY'S PAGE ANNOUNCEMENTS—AUGUST AND SEPTEMBER

Shows

TUESDAY, August 1
12 NOON to 7 P.M.

WEDNESDAY, August 2
10 A.M. to 5 P.M.

{ Fortnightly Show.
Hardy Flower Competition.
Gladiolus Competition.

TUESDAY, August 29
12 NOON to 7 P.M.

WEDNESDAY, August 30
10 A.M. to 5 P.M.

{ Fortnightly Show.
Cactus and Succulent Competition.
Plum Competition.
British Fuchsia Society's Competition.

TUESDAY, September 12
12 NOON to 7 P.M.

WEDNESDAY, September 13
10 A.M. to 5 P.M.

{ Fortnightly Show.
Cactus and Succulent Society's Competition.
Alpine Garden Society's Competition.

FRIDAY, September 15
12 NOON to 7 P.M.

{ *National Rose Society's Show.*

TUESDAY, September 19
1 P.M. to 7.30 P.M.

WEDNESDAY, September 20
10 A.M. to 5 P.M.

{ *National Dahlia Society's Show.*

TUESDAY, September 26
12 NOON to 7 P.M.

WEDNESDAY, September 27
10 A.M. to 5 P.M.

{ Fortnightly Show.

Lectures

TUESDAY, August 1 at 3 P.M. Masters Memorial Lecture, Part I
"The Origin and Improvement of Cultivated Plants" by
MR. M. B. CRANE, F.R.S., A.L.S., V.M.H. (John Innes Horticultural
Institution).

Lectures—continued

TUESDAY, August 29 at 3 P.M. Masters Memorial Lecture, Part II, "The Origin and Improvement of Cultivated Plants" by MR. M. B. CRANE, F.R.S., A.L.S., V.M.H. (John Innes Horticultural Institution).

TUESDAY, September 12 at 3 P.M. "Early Flowering Chrysanthemums" by MR. JOHN B. STEVENSON.

TUESDAY, September 26 at 3 P.M. "New Varieties of Dahlias and their Cultivation" by MR. STUART OGG.

Demonstrations at Wisley—The following demonstrations will be given at Wisley, that on the second day being in each case a repetition of the demonstration given on the first:—

Flower Garden

August 2, 3. Vegetative Propagation of Shrubs and Herbaceous Plants. (2-4 P.M.)

Vegetable Garden

September 13, 14. Harvesting and Storing. (2-4 P.M.)

Request for Old Copy of the Society's Proceedings—The Society is anxious to acquire for its Library one or two more copies of the "Proceedings of Horticultural Society of London" for the years 1838 to 1843, published in London in 1844. The Library Committee would be grateful to anyone who, having no further use for this volume, would be so kind as to present it to the Society.

Distribution of Seeds from Wisley—Last year the response from Fellows to the appeal for surplus seeds for distribution from Wisley was excellent. It is hoped that once again any Fellows who have such seeds from their gardens, especially of good or unusual plants, will be kind enough to collect them and send them, carefully labelled with the name of the plant, to the Director, R.H.S. Gardens, Wisley, Ripley, Woking, Surrey.

General Examination Results—At the General Examination in Horticulture held on March 22, 1950, there were one thousand two hundred and fifty-three candidates, of whom eight hundred and thirty-one were successful, eighty-seven being placed in Division I and seven hundred and forty-four in Division II. Four hundred and twenty-two candidates failed to satisfy the examiners.

At the General Examination in Horticulture for Juniors (*i.e.* those under eighteen years of age on March 1, 1950), which was held on March 22, there were two hundred and fifty-two candidates, of whom eighty-two passed and one hundred and seventy failed to satisfy the Examiners. Both these examinations consisted of written work only.

AGRICULTURAL WAGES ACT, 1948—EMPLOYMENT OF GARDENERS

The following Press notice, issued by the Ministry of Agriculture and Fisheries, is reprinted for the information of Fellows of the Society who may be affected:

On April 28, 1950, a Divisional Court consisting of the Lord Chief Justice (Lord Goddard), Mr. Justice Morris and Mr. Justice Finnemore held that two gardeners employed in the grounds of a private estate were workers employed in agriculture as defined in the Agricultural Wages Act, 1948.

The part of the grounds in which the two men were employed was a garden of $3\frac{1}{2}$ acres in which were eight greenhouses. About two-thirds of the garden was used for the cultivation of vegetables, and the remaining one-third for the cultivation of trees, flowers and other plants. Apart from an amount of flowers given to the local Church each week, the whole of the produce was either sold to the public or was supplied to the men's employer for use in his household. In the year ending 30th September, 1948, produce of the value of £528 6s. 6d. was sold to the public, and produce of the value of £133 os. od. was supplied to the employer's household.

In giving his judgment Lord Goddard pointed out that "agriculture" was defined in the Act as including "the production of any consumable produce which is grown for sale or for consumption or other use for the purposes of a trade or business or of any other undertaking (whether carried on for profit or not), and the use of land as grazing, meadow or pasture land or orchard or osier land or woodland or for market gardens or nursery grounds."

It was held that the men were employed in the production of consumable produce which was grown for sale, and that their employment was therefore, covered by the Act.

It was also held that work on which they were engaged fell within the words "the use of the land for market gardens" which were also in the definition.

WISLEY IN AUGUST

THIS month visitors will find the main features of interest in the Herbaceous and Annual Borders, the Floral Trial Grounds, and the Heather Garden, but while walking from place to place they will be attracted by a number of smaller but nevertheless charming scenes.

Directly inside the entrance gates is a colourful scarlet border of *Verbena* 'Lawrence Johnston,' in the middle of which is planted *Perovskia atriplicifolia*, the blue-grey flower spikes contrasting pleasantly with their surroundings. *Ceratostigma plumbaginoides* paints the cracks in the nearby walls and paving stones with streaks of vivid blue, while on the Laboratory walls behind are two flamboyant orange-red flowered Trumpet Vines, *Campsis grandiflora* and the hybrid *C. × Tagliabuana* (*grandiflora* × *radicans*), the hardier but slightly less free flowering of the two.

Along the Terrace Walk the geometrical beds are filled with brightly

coloured ornamental-leaved Pelargoniums, Heliotrope and Calceolarias, illustrating a type of gardening which until recently had not been represented at Wisley.

Riotous colours are once more appearing in the Dahlia beds and the huge spires of the Gladioli are at the peak of their display. The trials of Solidagos and Annual Asters are in full bloom, joined later in the month by the first flowers of the early Chrysanthemums.

The Annual Border contains varieties of most of the reliable annuals sown in large irregularly shaped drifts creating a gay patchwork effect. At the lower end is a small border consisting mainly of half-hardy annuals such as Petunias, Nemesis, *Phlox Drummondii* and *Salpiglossis*.

Running parallel are the Rose Borders, still colourful after several months' blossoming. Here can be seen two plants somewhat out of the usual run of Hybrid Tea Roses, the single-flowered 'L'Innocence' and 'Dainty Bess,' the former pure white, the latter a delicate shade of pink, both with beautifully formed fragrant flowers and a boss of yellow stamens. Walking in the direction of the Alpine House an attractive border is passed consisting of *Hypericum* 'Rowallane Hybrid' and *Salvia ambigua* (*coerulea*) which is edged with the delicate *Leucosium autumnale*.

The display in the Alpine House is past its best now, but nevertheless there are still some interesting plants to be seen, for example *Trichium Manglesii*, the pink flowers in dense hairy clusters on long wiry branches. *Phlox carolina* makes a bright patch of colour in contrast to the graceful pale yellow flowers of *Polemonium pauciflorum*, while *Gilia californica* is another pretty plant, the large open pink flowers set amongst feathery foliage.

Outside the Alpine House are beds of Gazanias, their orange, yellow and white flowers glistening in the sunshine. All these forms were originally raised from seed and interesting variations of the centre patterning can often be obtained in this way.

There are a number of Gentians flowering in the Rock Garden this month, notably *G. × hascombensis*, the dark blue *G. septemfida* and *G. gracilipes*. This latter species is a native of China and one that does quite well under ordinary garden conditions. The purple-blue flowers are solitary and long stalked, the lax branches arising from a central rosette of leaves. The species found in greatest quantity is *G. asclepiadea*; the graceful, two-foot-long stems, densely clothed with leaves, bear towards their tips axillary flowers which vary in colour from purple to white. Other plants in flower include the creeping *Polygonum vacciniifolium* and the taller, brighter coloured *P. affine*. In sunny crevices the Californian Fuchsia, *Zauschneria californica*, has made itself at home, the soft scarlet flowers forming a welcome touch of colour at this season, as do the brighter scarlet umbels of the somewhat tender *Verbena chamaedryfolia*.

In the Alpine Meadow a clump of Yuccas is producing creamy flower-spikes. The base of this group is ringed by a mixed planting of Hostas, ornamental both in foliage and flower. Fragrant white flower-spikes are appearing in the Sweet Pepperbush, *Clethra alnifolia*, which makes a bushy tree up to ten feet in height, spreading by means of suckers; this species will only grow under acid conditions.

Again in the Wild Garden the Willow Gentian is widespread, seeding itself freely. The charming flowers of *Cyclamen neapolitanum* also appear as the month advances, large clumps being found on the northerly fringes and near the Fern collection. Among the woody plants there are only four species remaining in bloom, all of them white-flowered. These are the hybrid *Eucryphia* \times *nymansensis* (*glutinosa* \times *cordifolia*), *Hydrangea paniculata* var. *grandiflora*, with large pyramidal panicles which fade to shades of pink and green, *Cyrilla racemiflora*, an uncommon North American plant with long pendent racemes, and *Oxydendron arboreum*, colouring brilliantly in the autumn.

Emerging from the shadowy Wild Garden into Seven Acres the brilliant colours of the Heaths and the impression of space created by curving lines and broad sweeps of grass come as somewhat of a surprise. Numerous varieties of Ling make bold patches of colour, supplemented by the Cornish Heath and varieties of *Erica cinerea*. There is also to be found *E. ciliaris*, and its variety *Maweana*, a very distinct and superior form, the flowers being half an inch long and the foliage stouter and darker green. *E. Watsoni* is a hybrid between this species and *E. Tetralix*, having the flower characteristics of the former and leaf arrangement of the latter. A close ally to Erica, *Daboecia cantabrica* and its white form, are also planted in broad drifts. Waving above this colourful carpet is the tree-like Mt. Etna Broom, *Genista aethnensis*, bearing golden flowers towards the ends of pendent, almost leafless branches. In the general shrub collection are pink-flowered Spiraeas of the Japonica group, *Spiraea arborea*, with large panicles of creamy flowers and bold pinnate leaves, and the purple spires of *Buddleia Davidi*. The shrubby Chestnut, *Aesculus parviflora*, is a good plant for this season, also colouring well in the autumn.

Common and uncommon plants are brought together in the Herbaceous Borders to form a colourful design, Rudbeckias, Heleniums, Lysimachias and Salvias being dominant. The first of the Michaelmas Daisies begin to flower this month with *Aster acris* and *A. Amellus* whose large blue ray florets and deep yellow disc are very striking.

In the Stove House a succession of Orchids is coming into bloom, set off by a fine collection of foliage plants.

At the present time the Temperate House is stocked with an extremely interesting and varied collection, showing, in addition to flowers, a great diversity of ornamental foliage. Among the plants in flower are *Tibouchina semidecandra* with large, royal purple blooms and velvety foliage, *Malva umbellata*, a huge, bushy Mallow with rich crimson flowers, the gay *Hibiscus rosa-sinensis* in shades of carmine, rose or yellow, and *Moschosma riparium*, a vigorous, musk-scented shrub with Coleus-like foliage and long panicles of small mauve-tinted blossoms. Some of the more striking foliage plants are *Melianthus major*, whose fine grey-green, Acanthus-like leaves are furnished with unusually large stipules, young specimens of several species of Eucalyptus, *Musa fertilis*, spreading large Banana-leaves high above its companions, and two large, globular specimens of the Elk's-Horn Fern, *Platyserium alcinorne*, suspended from the roof-ties.

AN EXPEDITION TO NEPAL

O. Polunin, M.A., F.L.S.

(Lecture given on January 31, 1950, COLONEL F. C. STERN, F.L.S.,

V.M.H., in the Chair)

EARLY last year I had the good fortune to be asked to join an expedition to the Central Nepal Himalaya which was being organized by the Himalayan Committee. It was the first time since the memorable journey of SIR J. D. HOOKER in 1848 to East Nepal, that a European party had been given permission to explore the mountains lying within the boundaries of Nepal.

The expedition was organized in the first place as a climbing expedition under the experienced leadership of MAJOR H. W. TILMAN, but on the recommendation of HIS HIGHNESS THE MAHARAJA OF NEPAL, two scientists were included in the party. Our terrain was to be the two mountain massifs lying on the Nepal-Tibet boundary, the Langtang Himal and the Ganesh Himal with peaks of 23,000 and 24,000 feet.

Before proceeding with my personal account of our journey, it would be as well to give a brief outline of previous botanical work done in Nepal. The earliest collections date from HAMILTON (1802-1803) and it is largely from these plants that D. DON published the only flora of Nepal, *Prodromus Florae Nepalensis*, in 1825. HAMILTON's plants came from the valley of Katmandu and from the foothills lying to the South.

WALLICH, a great collector of Asiatic plants and Director of the Calcutta Botanic Gardens, spent a year at Katmandu (1820-1821) and collected intensively in the valley and among the low wooded hills surrounding it. Although he was not allowed to go beyond the confines of the valley, a rule that exists to the present day, he prevailed on pilgrims to bring him plants from the mountains surrounding the sacred lakes of Gosainkund.* These lie at an altitude of 15,000 feet and are three to four days' march north of Katmandu. They are visited annually by thousands of pilgrims during the months of August and September, and it is from this locality that many interesting Himalayan plants were recorded for the first time by WALLICH. DON's *Prodromus* contains the descriptions of some of WALLICH's Nepal plants and it includes such interesting horticultural plants as *Primula rotundifolia* and *Potentilla coriandrifolia*, which were not rediscovered until 1927. From WALLICH's time to the present day our knowledge of the flora of Nepal has lagged markedly behind that of the other states lying along the Himalayan range. HOOKER's collections in 1848 and a short journey by BURKILL in 1907 to Nawakot, ten miles to the west of Katmandu, are the only two collecting journeys made in the mountains of Nepal during the 100 years that followed after WALLICH's visit.

However, between 1927 and 1937, two Nepalese collectors, DHWOJ and SHARMA, made extensive journeys in search of herbarium specimens and horticultural treasures. They found some outstanding new and little known plants such as *Meconopsis regia*, *M. longipetiolata*, *M. Dhwojii*, *Primula Wigramiana*, *P. Wollastonii*, *P. buryana*, *Cyananthus Hayana*, *Cyananthus pedunculatus* var. *crenatus*, *Gentiana ornata*. Many

* Or Gosainthain.

of these plants were first grown by MR. T. HAY in Hyde Park from seed sent back by these collectors and some of them are now well established in our gardens. It is difficult to follow the exact routes of these collectors owing to variation in the spelling of place names, but they covered most of East, Central, and West Nepal as far as the massif of Annapurna, and it is probable that they have collected most of the conspicuous and attractive alpine plants of this area. Although they had not apparently collected in the two valleys visited by this summer's expedition, no new *Primulas*, *Meconopsis* or *Rhododendron* species were discovered.

Thus it happens, with the exception of odd collections made in the valley and the Nepal Terai (plains), that since the first visit made 150 years ago the number of botanists collecting in this 500 mile stretch of the Himalaya can be numbered on the fingers of one hand.

The party of two climbers and two scientists met in Katmandu towards the end of May 1949. We were most hospitably entertained at the British Embassy and spent a few busy days making the final preparations for our journey of exploration in the mountains. Between sorting loads, buying stocks of food and arranging for coolies we managed to find some time to look round this enchanting valley. It lies 4,000 feet up in the foothills, surrounded on all sides by steep round-topped wooded hills. The old Newar cities of Katmandu, Patan and Bhadgaon, red bricked and red tiled, stand shoulder to shoulder with the stately white palaces of the modern Gurkha rulers. Hindu temples, with wonderfully carved animals, gods, demons and with Chinese-like tiered roofs contrast strangely with the simple form of the great Buddhist Stupas of Boddhnath and Swayumbhunath. The white-washed dome, surmounted by a gilded tower with enormous penetrating eyes painted on its base, is an awe-inspiring sight to western eyes. Every part of the valley is industriously terraced and carries two heavy crops each year; a crop of wheat in early spring and one of rice in September. There are few animals or woods in the valley as every part of it has to be given over to the production of crops to feed the teeming population. To the north, in clear weather, the great white frize of the snowcapped Himalaya stretches from horizon to horizon.

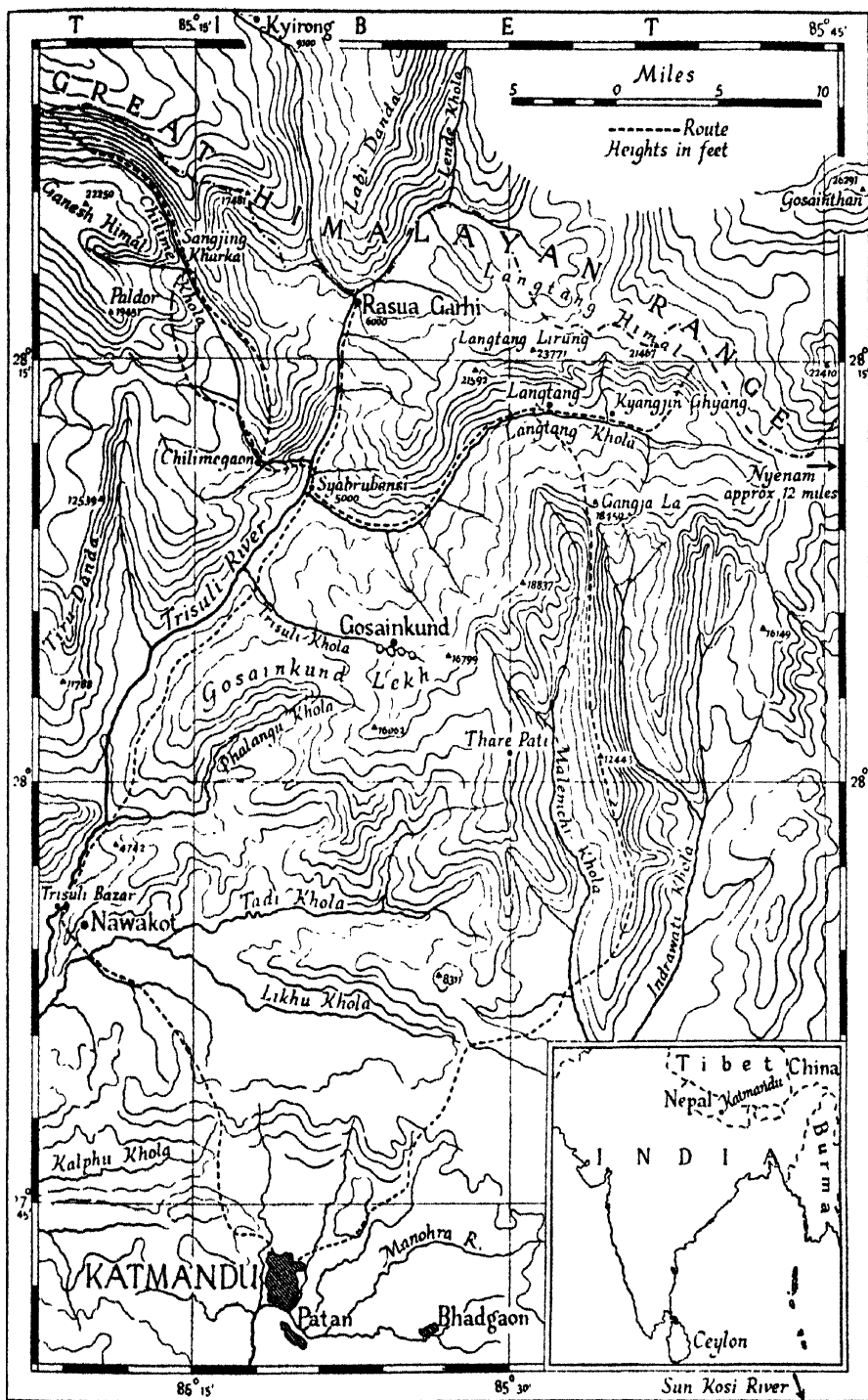
On May 29 we left Katmandu with 40 coolies, 4 Sherpa porters and a Lieutenant of the Nepal Army, and with sufficient food to tide us over the three and a half months stay in the mountains. The expedition was planned with a view to maximum mobility and minimum weight, not ideal for the collector, but essential in such a steep and undeveloped country. We made our way westwards across the low hills to Nawakot and to the great gorge of the Trisuli River, which carves its way through the mountains in its headlong rush to the Ganges. These lower foothills are sculptured into innumerable narrow terraces wherever the slope is sufficiently gentle to allow for cultivation; elsewhere rough scrub and dry earthy eroded slopes take the place of what must once have been dense forest. Small groups of thatched houses with red mud walls are scattered over the valley sides while narrow earth foot-worn paths are the only means of progress. Beasts of burden are not used in this primitive countryside and in their stead there is a continuous passage of coolies carrying many kinds of produce. Flour, vegetables, chickens or

worldly belongings would constantly pass on the backs of the populace, and it was a common sight to see a whole family bringing wood into the valley. The husband carried a large baulk of "sal" wood, slung across his shoulders from a headband, while his wife carried an equally huge beam and the children followed behind with their own bundles of firewood, graded according to their respective ages. There is a great scarcity of fuel and building material in Katmandu and much of the wood has to be carried by coolies for a three to four days' journey from the extensive forests of the plains (Terai).

On the second day we dropped down to 2,000 feet amid Mango groves and young Maize to the roaring glacial torrent of the Trisuli River; the cool breath of the river gave us some slight taste of the tremendous country we were soon to penetrate. We now turned north, up the gorge itself and followed the rough paths along its flank at 6,000 to 8,000 feet; at this height the slope is less precipitous and we passed across grassy slopes with scattered Cheer Pine, *Pinus Roxburghii* (*longifolia*) or through dense shrubby forests of evergreen Oaks and Rhododendron, *R. arboreum*. Above us to the east rose ranks of Fir-covered hills, rising to the grassy slopes of the Gosainkund Lekh. The sacred lakes lay among these hills only 6 miles away, and it was with regret that I passed so close to this historical locality without having time to make a visit. On the sixth day we arrived at the junction of the Langtang Khola and the Trisuli River, a day's march short of the Tibet border. We turned up this steep V-shaped valley traversing a thousand feet or more above the ribbon of the river in the valley floor. The Himalayan Blue Pine, *Pinus Wallichiana* (*P. excelsa*) now occupied the dryer grassy slopes at 8,000 feet. Shrubs of Berberis, Indigofera and the beautiful *Desmodium tiliaefolium* (*P. 42**) with greyish foliage and pendulous racemes of delicate purple flowers formed thickets in open situations. It was here that I found the only true Lily on the journey, *Lilium nepalense* with its greenish-yellow recurved petals and chocolate centres. It flourished on dryish grassy slopes in the vicinity of bushes but not in deep shade, and it ranged from 9,000 to 11,000 feet in this valley and may therefore be hardy. Striking purple Roscoeas and the little yellow stars of Hypoxis were common before the monsoon rains, while later a number of attractive ground Orchids came into flower. Particularly charming were the large Habenarias, reminiscent of our own Butterfly Orchids, with white petals and a long 3-lobed lip deeply fringed with glistening honey-green segments looking like feathery dragonflies. Each flower was 2 inches across and bore a single slender spur.

The narrow grassy path dropped down quite suddenly to the bottom of the valley, and we were plunged into a very different world of dripping forests, perpendicular cliffs and roaring waters. Oaks—predominantly *Quercus semecarpifolia*, Maples and the Firs *Tsuga Brunoniana* and *Abies Webbiana*, with thickets of tall Bamboo, formed a dense almost impenetrable forest and it was essential to keep to the rough tracks blazed by the hillmen to make any progress. This abrupt change of vegetation was no doubt due to the perpetual stream of cloud and

* Numbers refer to seed collection numbers, not herbarium specimens.



Map showing route in Nepal

mist that daily funnels up the valley on its way to the high mountains. A filigree of Lichens hung from every bough and rich gardens of epiphytic Ferns clung to the trunks and branches of the forest trees. There is little to interest the gardener in these forbidding forests, but mention must be made of the two *Rhododendrons* found commonly in this type of plant community. *Rhododendron barbatum* grew in deep shade and its smooth pink bark and delicate cinnamon reverse to the leaves made it an attractive shrub even when not in flower, while *Rhododendron cinnamomeum* with crinkled leaves and rusty brown reverse favoured the more open clearings in the forest. Various charming Gesneriads such as *Chirita* and *Platystemma* enjoyed the damp moss-covered boulders, and in one place I came across a striking parasite, *Balanophora*, scarlet in colour and flecked with small orange spots. The inflorescence is a compact globose head borne on a stout stem, 2-4 inches in height and looking very like a Stink-horn fungus in shape.

Equally suddenly we came out of this moist forest into a deep U-shaped valley (the limit of previous glaciation) and right above us, towering 23,000 feet into the clear air, was the majestic snow cone of the Langtang Lirung. This was the mountain which the climbers hoped to attack but which later proved unassailable from all points of the compass.

We established our base camp at Langtang village, at an altitude of 11,000 feet, on a grassy meadow intersected by clear mountain streams. It is a sizable village of about thirty houses populated by a sturdy race of Lama Tamans—half Tibetan and half Nepal Hill tribesmen (Tamans). At this altitude they were able to cultivate crops of Wheat, Barley, Buckwheat and Potatoes in small fields on the river terraces, and they had herds of yak, zos (hybrid cow-yak), cows and sheep which the men folk took up to high grazings or "Kharkas" during the summer months. Butter was produced in some quantity and exchanged for salt from the deposits near Kyirong, several days' march away in Tibet. They were friendly, smelly people, clad in rough homespun cloaks tied round the middle with several turns of a woollen belt; they would often cluster round our small tents and watch us curiously as we wrote in our notebooks, or asked to have a peep through the binoculars. They supplied us rather reluctantly with small quantities of potatoes, butter and eggs, which helped to enliven our otherwise monotonous diet and they also carried for us after a certain amount of persuasion by the Nepalese Lieutenant.

I spent many days collecting in the lower Langtang valley between 9,000 and 12,000 feet, while the climbers explored the intricate system of glaciers and peaks at the head of the valley. The forest had been felled in the vicinity of the village and in its place dense scrub, meadows and rough fields, surrounded by substantial stone walls, occupied the gentler slopes. Towering cliffs and precipices, draped with traceries of waterfalls, rose many thousand feet above the village. Birch, Fir, Larch and *Rhododendrons* clung precariously to the rock ledges.

It presented a great variety of habitats for the plant hunter and was indeed the home of many good species.

In June the scrub near the village was gay with colour. Several

robust species of *Berberis* were ablaze with tresses of golden flowers. A handsome Rose, *Rosa macrophylla* (P. 65), up to 10 feet in height, with rich pink flowers 3 inches across and purple bloom to leaf and bud, was a fine sight among the stony screes. Another more discreet Rose, *Rosa sericea* (P. 62) with single white inverted flowers and grey hairy foliage, was also common. *Rhododendron lepidotum* formed low thickets; it bears half-a-dozen shallow cup-shaped flowers of a rich magenta colour, above inch-long oval leaves. The sepals and pedicels are covered in glandular brown scales which adds enchantment to the plant when seen in the morning sun. Other shrubs such as *Spiraea bella* (P. 67), *Cotoneaster microphylla* (P. 98), Hippophae, Deutzia, occurred more sparingly.

I saw my first *Meconopsis* here, trailing its golden yellow leaves in a streamlet; it was *Meconopsis paniculata* (P. 10), (Fig. 160), and it always seemed happiest with its roots near water. There was one particular plant, 9 feet in height, draped with enormous yellow bells which I often visited and which later provided me with a bagful of black seed. Alas, the collecting of seed is not always as easy as this, for by contrast I spent an hour or more looking for the tiny explosive fruits of *Corydalis cashmeriana* (P. 24) in a spot which had been sparkling with its bright blue flowers earlier in the year, and I finally succeeded in getting fewer than a dozen seeds.

The more delicate and golden-haired *Meconopsis Dhwojii* (P. 15) grew in damper situations, sometimes sprayed with water; it could be distinguished in the field by its oblong-ellipsoid capsule, in comparison with the globose capsule of *M. paniculata*.

Another very attractive plant which grew in great abundance on grassy ledges and among low scrub was *Thalictrum Chelidonii* (P. 59), (Fig. 176), and which, unlike our cultivated species, has well developed petals. It is about 2 to 3 feet in height and the grey-green leaves with delicately crenulate leaflets make an attractive foil to the lightly poised heads of pink flowers. *Thalictrum virgatum* (P. 126), with white petals and whorls of leaves favoured grassy ledges in perpetual water-drip and in contrast to the former species looked difficult to please as regards soil and situation. Two other plants worthy of mention and which were more frequent at lower altitudes were *Thermopsis barbata* (P. 27), (Fig. 164), and *Notholirion macrophyllum* (P. 134), (Fig. 159). The former is a striking Legume with dark liver-purple flowers 1½ inch in length, borne loosely on an erect panicle a foot in height. The silky grey leaves reach maturity after flowering so that the inflorescence is carried well above the young leaves. In the early morning the whole plant glistens with innumerable drops of dew. The latter is a charming dwarf Lily, with two to four pinkish-purple 2-inch tubular flowers, growing in the rough pastures.

The climbers soon discovered that the Upper Langtang valley was much more complicated than was indicated by the quarter-inch map which we had with us (Nepal and Tibet No. 71h). This had been made in 1931 by an Indian Survey party and it was obvious that it was mostly a matter of guess-work in the more inaccessible parts of this valley. There is a considerable region labelled unsurveyed on the

Tibetan side of the frontier and the 26,000 feet mountain of Gosainthan formed the northern boundary of this unknown area. PETER LLOYD had planned to make a photo survey of this upper part of the valley, and he spent the first few weeks surveying the region and attempting to tie-up the Langtang valley with Gosainthan, while TILMAN made some exploratory journeys. They were, unfortunately, not able to identify the mountain with certainty but they proved that the Langtang valley runs some miles into the supposed Tibetan territory and that there is a possibility that it penetrates as far as the Southern flank of Gosainthan. The head of the valley is about five marches up the valley from Langtang village and as the last three marches were over glacier and scree, I remained behind in the lower camp and collected up the lateral valleys to a height of about 17,000 feet. I had a most reliable Sherpa to cook, carry and help with the plant collecting, and at a later date a Goanese skinner to collect and prepare birds for the Natural History Museum.

My next important collecting ground was at about 12,500 feet, where I had easy access to the Birch forests and some high moraines in the great rock amphitheatre of the Langtang Lirung.

We camped below the little Gompa at Kyangjin Ghyang on close cropped turf amid the constant jingle of Yak bells. This was one of the first summer grazings or "Kharkas" above Langtang and a number of sturdy stone shelters covered with bamboo matting roofs were occupied by the herdsmen and the younger members of the animal community. A smoky fire burned in the middle of the floor and big wooden tubs with curds and butter in various stages of preparation stood round the walls. We bought from the herdsmen for one rupee (less than 1s.) a big ball of yellow butter—the size of a cannon ball, wrapped in a Rhubarb leaf—to augment our simple diet of rice, flour and pemmican. A low scrub of *Rhododendron elaeagnoides*, *Spiraea canescens* (P. 33), *Potentilla fruticosa* (P. 96) and *Lonicera* covered the stony slopes. A handsome Fritillary, *Fritillaria cirrhosa* (P. 12), carried its mottled brown bells above the foot-high scrub, and the dull purple flowered *Nomocharis nana* (P. 89) also favoured some protection to its bulbs. The bulbs of the Fritillary are sought after by the Sherpa porters and eaten as a preventive against goitre: the Langtang villagers seemed to be unaware of this, and certainly many of them had large unsightly goitres.

The river here spread out on to gravel flats and spiny bushes of *Eleagnus*, *Ephedra*, and the sweet-scented *Lonicera rupicola* (P. 36) with pale purple trumpet flowers, colonized these areas.

Three species of *Cyananthus* grew in the short turf and earth banks. *Cyananthus lobatus*, with periwinkle blue flowers and brown hairs to the inflated calyx, was a very handsome plant in August; a large clump may bear twenty or thirty flowers each 2 inches across, presenting a blaze of colour. *Cyananthus incanus* is a prostrate plant with trailing shoots bearing little clear blue flowers with bearded petals, while in the weedy *Cyananthus Hookerii* the minute blue corolla is almost lost in the inflated calyx. More striking even than *C. lobatus* in the intensity of its blue flowers was a delicate *Delphinium* (near *denuatum*). (Fig. 172.) It has an erect stem of 1 to 2 feet slightly branched with glabrous stems and

deeply dissected leaves with a few linear segments. It favoured grassy meadows and was a delight to the eye in early September.

I made several journeys into the Birch forests in search of birds and flowers. Treecreepers, Nuthatches and Tits, reminiscent of our own species, hunted insects in the peeling strips of bark which hung from the branches of the gnarled and weathered trees. These Birch forests form a zone of vegetation (on the steep valley sides) above the Silver Fir, ranging in altitude between 11,000 to 13,000 feet. *Rhododendron campanulatum* forms a dense undershrub accompanied by a Mountain Ash and a rich carpet of mosses and ferns. The only herbaceous plant worthy of note was a butter-coloured Primrose, *Primula strumosa* (P. 18), which rejoiced in more open glades and a rushing streamlet.

At the higher limit of the Birch forest the *Rhododendron* and Mountain Ash straggled upwards a further 500 feet until their place was taken by two dwarf bush *Rhododendrons*. They were *Rhododendron anthopogon* and *R. setosum* and they formed a crisp aromatic scrub 6 inches to a foot in height between 13,000 and 16,000 feet on peaty slopes. *Rhododendron anthopogon* was dominant over extensive areas. It has a compact head of white flowers sometimes tinged with pink, which often appeared to be damaged by exposure; its dark oval leaves, covered with brown scales beneath, are strongly aromatic when crushed. *Rhododendron setosum* was a much more local plant. It has the same low bushy habit as the previous species but the bright magenta flowers are much more showy, while the bristly leaves and prominent stamens give it a striking appearance. *Cassiope fastigiata* and *Gaultheria trichophylla* (P. 31) also favoured these peaty slopes. The latter bears sky-blue berries, the size of hedge-sparrows' eggs, which the Sherpas eat with relish. It is obviously an acquired taste as their flavour reminded me of some very modern, very synthetic chemical tooth-paste. A surprising smell was the pungent hot-house odour of *Codonopsis thalictrifolia*; one quickly became aware of its presence when the small prostrate shoots were crushed. It was some time before I saw the delicate milky-blue 2-inch trumpets borne on long stems and learned to associate them with this strange odour. It is a very beautiful plant with a character all of its own.

Another locality which afforded me endless pleasure and revealed some fine plants were the dank, dripping cliffs at the base of rock walls. This was the favourite haunt of that most charming of all *Meconopsis*, *M. bella* (P. 26), and it seemed happiest when actually dripped upon, and where it could force its tap root between narrow cracks in the rock. Never more than 6 inches in height, its delicate blue inverted bells hung from crevices in the black rock and a frill of finely dissected glaucous leaves arose from its thick rootstock. Delicate white bells of the Liliaceous *Lloydia* and the white heads of *Primula buryana* lined the mossy crevices. This latter is a charming little plant, first found by WOLLASTON near Nyenam in Tibet, about thirty miles to the East of Langtang on the 1921 Everest Reconnaissance Expedition. Species of *Potentilla*, *Cremanthodium*, *Thalictrum* and *Pedicularis* made a splash of local colour on these otherwise forbidding cliffs.

The *Rhododendrons* showed a regular altitude zonation but the

Primulas, on the other hand, were restricted to localized habitats. I found a total of twenty species, indicating a falling off in numbers from the greatest concentration of species at the Eastern end of the Himalaya.

In addition to *Primula buryana*, I found another of WOLLASTON'S Nyensam species, *Primula Wollastonii* (P. 72), a very beautiful plant of which I was able to obtain seed. (Fig. 175.) Seed had previously been collected by SHARMA and DHWOJ and it has been cultivated in this country, but it is rare if not now out of cultivation. The slender 6-inch stem rises from a flat rosette of hairy grey leaves, set tight against the soil. The flowers are borne in compact heads, with thimble-shaped corollas and hairy sepals; they are pure blue in colour, exquisite in shape and dusted with snowy farina. This plant flourished on dry well-drained banks among short grass and did not seem to demand the peculiar mixture of drainage and moisture which is often so difficult to imitate in this country. It was, however, a very local plant growing at an altitude of about 16,000 feet. *Primula macrophylla* (P. 28) seemed much more exacting in its requirements and was always to be found among rock chips over which there was a constant trickle of water. In one stony moraine at about 16,500 feet we came across half an acre of this lovely plant, consisting almost entirely of the white-flowered variety although occasional pale mauve flowers were to be seen. It has an erect rosette of lanceolate leaves, thickly coated with yellow "farina" and carried a full head of large sweet-scented flowers. Even in fruit the olive-green calyx edged with yellow "farina" and the elongated brown-tipped capsules presented a striking appearance.

There were several minute species of *Primula* on the peaty banks and in sheltered hollows. *Primula pusilla* (P. 113) 2 inches in height with a small head of purple flowers and white hairs filling the mouth of the corolla occurred quite commonly throughout the area. Also *Primula concinna*, *P. flagellaris* and *P. tenuiloba* were frequent in the upper valleys. Their almost prostrate pink or purple flowers were just carried above the minute rosettes of leaves. *P. muscoides*, the smallest of them all, formed moss-like cushions through which sessile white flowers just managed to squeeze their way to the light. *P. sikkimensis* (P. 97) and the related *P. reticulata* (P. 97) grew commonly along the stream sides in the more sheltered part of the valley. The latter species is a slenderer plant and can easily be distinguished in the field by the cordate base to the leaves and long distinct petioles. *P. denticulata* (P. 21) and the smaller related species *P. atrodentata* (P. 21) were common on the grassy bushy slopes in June. The former particularly relished ground churned up by cattle the previous year and formed a brave show of rounded purple heads on robust stalks near many of the summer dwellings. *Primula rotundifolia* (P. 23) occurred sparingly under sheltered rock ledges and its rounded leaves and bright magenta flowers made it an attractive if rather straggling plant.

Two other striking *Primulas* were *Primula obliqua* and *P. Stuartii* which often grew together on stony grass-covered slopes between 13,000 and 15,000 feet. *P. obliqua* is a robust plant, 1 to 2 feet in height, with spear-shaped yellow green mealy leaves, and a number of stout mealy stems bearing a drooping head of about ten flowers. Each flower

is more than an inch across, pure white in colour with a lemon-yellow centre. *P. Stuartii* is similar in stature and also covered all over with a yellow "farina" but its flowers are orange-yellow and very delicately scented. It fails, in my opinion, to reach the top rank of *Primulas* owing to the dentate corolla segments but it is otherwise a very lovely plant.

As one continued up the valley the scenery became increasingly wild and magnificent; an impenetrable wall of rock capped with snow and ice cut us off from the east; great tips of rock debris fanned out into the valley from the disintegrating cliffs above; moraines swept down from the lateral valleys leaving piles of boulders, a hundred feet or more in height, strewn across the valley floor. The Langtang river carved its way through these moraines and spread out on to sandy flats between each moraine. Willow thickets and a low scrub of *Rhododendron*, *Potentilla* and *Lonicera* covered these flats and boulder slopes. There were many birds to be seen in this wild setting; characteristically Laughing-Thrushes, Shrikes, Rosefinches and Redstarts, while the little brown Pika or Mouse-hare, the size of a large water vole, with a rounded whiskered face and a tail-less rump was often to be seen scampering over the boulders or basking in the morning sun. At about 15,000 feet the main glacier was reached, and a "sea" of rock boulders, dirty black ice and mud continued up the valley for several miles. However, the "ablation" valleys, left by the shrinkage of the main glacier from the rock walls, rose another 1,000 feet up the valley sides. Little flat meadows, formed by the accumulation of sand and intersected with sparkling streams, succeeded one another as one climbed higher. *Saxifraga*, *Androsace*, *Aster*, *Leontopodium*, *Swertia* and *Cremanthodium* were now the commonest genera. *Gentiana nubigena* occurred locally in this kind of habitat. It is a fine dark blue *Gentian* bearing two to four flowers on a short stem; the outside of the corolla is striped with dark blue veins against a greenish yellow ground. The *Cremanthodiums* were the most conspicuous and delightful plants here and it is very much to be regretted that they have proved to be so difficult in this country. *Cremanthodium plantagineum* (Fig. 162), for example, has an erect rosette of yellowish primula-like leaves, and it bears a few erect stems, each carrying a single inverted golden flower with the involucre bracts covered with woolly brown hairs. Other species have kidney-shaped leaves and larger individual capitula.

Quite distinct were the plants, often woolly in appearance, which grew on the drier scree slopes. *Saussurea gossipiphora* (P. 102, 120) (Fig. 161) was the most striking of all these plants. It looked like a spherical ball of cotton wool, with the tips of the rosettes of leaves barely breaking the surface. A small hole in the top, the size of one's little finger, allowed the entry of humble-bees to the completely enclosed head of flowers. WOLLASTON records that even under snow bees would sometimes fly from these plants when disturbed; certainly the temperature within the plants was noticeably higher than that of the surrounding atmosphere. Another striking plant, covered in silky hairs, was *Eriophyton Wallichianum* (P. 84), with large dull magenta flowers hidden under the grey leaves. However, the best of all these high altitude scree plants, growing

at about 16,500 feet was *Delphinium Brunonianum* (P. 95). (Fig. 163.) It favoured rather large scree among which its shoots could ramble. The leaves are short stalked and deeply dissected, but orbicular in outline. A 6-inch stem carries three or four large balloon-shaped flowers, pure blue in colour, hairy on the outside and veined with darker blue lines. The spur is short and conical, adding to the inflated appearance of the flower, and the petal tips a brown velvet colour. However, there is a crowning joy to the sparkling blue flowers set among the grey lichen-covered scree, that is the wonderful rich oriental scent that is given off by the mature flowers. The Sherpas collected a bunch of these flowers and carried them down to the camp; they use them as an insect repellent, for several days we enjoyed the exotic perfume. Others have described it is an unpleasant smell and it is possible that the scent varies with different races of the plant.

At the end of June, after the climbers had explored the upper Langtang valley, we made our way down to the Pine forests of the Trisuli valley once more, in an attempt to find a route to the Langtang Lirung from the West. We made our headquarters at the old fort of Rasua Garhi which guards the entrance to Nepal. It is squeezed into the bottom of the valley at the junction of the east and west branches of the Trisuli River. The grey glacial torrent thunders between perpendicular cliffs, for it is at this point that the river forces its way through the main range of the Himalaya; Rasua Garhi is at 6,000 feet and six miles away tower peaks of 21,000 feet. These great gorges are a characteristic feature of many Himalayan rivers which rise in the Tibetan plateau and cut their way through the main range to the plains of India. The old fort, built about ninety years ago to withstand a Tibetan invasion, now harbours a small guard of militiamen, enlisted locally. A wooden cantilever bridge spans the river to the path leading up the valley to Kyirong in Tibet and about 5,000 man-loads pass this outpost annually, carrying flour, rice, butter and salt. On the Tibetan side of the frontier there is not even a sentry post to deter the traveller from straying into the "forbidden" land. During the day time a warm breeze blows from the south and maintains a narrow band of blue sky above the gorge while the precipices on either side are clothed in heavy cloud. The monsoon had set in with determination during our last days at Langtang and the odd days at Rasua were a blessing for plant drying.

From this camp we made an unsuccessful attempt to reach the snows of the Lirung, through steep and difficult country in very wet weather. A three days march through the characteristic zones of vegetation, dominated successively by *Pinus Roxburghii*, *Quercus semecarpifolia*, *Abies Webbiana* and *Betula* brought us to a smoky herdsman's hut on a grassy alp. Here *Primula obliqua*, *P. Stuartii*, *P. pusilla*, *Meconopsis longipetiolata* (Fig. 173). Potentillas, Swertias and the homely Marsh Marigold occurred in some abundance. A further climb in the mist and drizzle, up loose scree to a rocky wall, with cushion Saxifrages, Androsaces and the brilliant blue *Meconopsis horridula* (P. 87) peeping from dry ledges, took us on to the chaotic wastes of rock debris which accumulates everywhere in these rapidly disintegrating mountains at high altitudes below the snow-line. We finally arrived at the first stage of our

journey, a milky-blue lake set among green pastures and foot high thickets of *Rhododendron anthopogon*. In the evening, as the mist cleared for a few minutes, we did catch a glimpse of the magnificent snow cone of the mountain, still many thousand feet above us, with its flutings of dazzling snow, and its corroded tongues of hanging glaciers.

Three days' march had brought us a horizontal distance of about six miles but we were still far from a possible route on to the mountain. I expected to stay here some days while the climbers tried to force a route round a jagged rock arête which cut us off from the next valley, but they were unsuccessful and decided to return forthwith. In consequence I was only able to make a hurried collection in this interesting locality. I remember particularly an attractive deep blue *Swertia* which formed a loose rosette in peaty turf. It bore twenty to forty blue flowers each $\frac{1}{2}$ -inch across, in a loose but almost prostrate head. Stamens, ovaries, peduncles were also suffused with dark blue pigmentation.

Corydalis meifolia was frequent here among the scree. It has a loose head of golden flowers with brown petal tips, growing out of glaucous dissected leaves.

However, my collecting was soon cut short and we returned once more to the tortuous track leading down through slippery *Rhododendron* thickets, and leech-infested Oak forests. We lingered in these unpleasant damp forests no longer than necessary and in two more days were once again in the warm sun of Rasua Garhi.

We now turned our attention to the Himal Ganesh group situated to the West of the Trisuli Gorge. This necessitated a day's journey down the Trisuli to Chilimegoan at 5,000 feet, an indescribably dirty village, huddled on a rock mound amid fields of Maize and newly planted Millet. A further three days' journey once again through dripping Oak and Fir forests brought us to the Upper Chilime valley, at the head of which lay the 23,000 and 24,000 feet mountains of the Himal Ganesh. Here we spent two weeks in almost continuous mist and drizzle and only occasionally in the early morning was it sufficiently clear for us to see the great snow pyramid of the 24,000 feet unnamed peak which blocked the head of the valley. This valley (about 13,000 feet) lay higher than Langtang and above the Birch forest zone, in consequence the flora showed less variety, but by contrast there was a dense low growth of Juniper over the hillsides. However, extensive areas of Juniper had been burned, to improve the grazing, by the Tibetans who came over from the Kyirong Valley in the summer months.

We made our base camp among a group of stone huts with the wooden roof shingles neatly stacked in the corner of each hut in anticipation of summer occupation by herdsmen. The Chilime River cut its way through the rocky valley floor and the grassy slopes on each side were rich in *Primulas*, *Meconopsis*, *Delphiniums*, etc. The robust hairy spikes of *Meconopsis discigera* (P. 127) were a conspicuous feature of the valley (Fig. 171). The flowers are about 3 inches across, of a rich dark purple with golden stamens, the fat buds are covered with golden hairs and the young capsules have a brown disc. The disc is an unusual feature which is shared with another species (*M. torquata*) and which shows an affinity with the capsules of the true Poppies. Two handsome species

of *Pedicularis* were common here in the turf. *Pedicularis Sculleyana* (P. 71) with a "loose billow" of cream flowers each an inch across cupping a brownish-purple keel. Each head was a foot in height and 6 inches in diameter of twenty to thirty delicate shell-like flowers. Another species, *P. megalantha*, with rich magenta flowers also formed striking heads of large flowers in the short turf. It is very unfortunate that these semi-parasites cannot be cultivated without their hosts, for they make a fine show of colour. Two species of *Aconitum*, one with dark blue and one with yellow flowers, and species of *Parnassia*, *Saxifraga*, *Morina* and *Cremanthodium* were more abundant here than in Langtang.

The climbers once again explored the upper moraines and glaciers of the valley; a possible route was found up the 24,000 feet mountain but an icefall made the first step dangerous. They, however, climbed a 19,500 feet peak named Paldor which lies to the south-east of the main massif. Throughout the monsoon period the weather was very mild and the absence of night frost made the snow conditions above 20,000 feet almost impossible for climbing. We returned by a different route to Chilimegaon, along an exposed switch-backed ridge, and at the end of the second day the mists suddenly rolled back to reveal a wide panorama of mountains around us, like a frozen sea thrown into a turmoil by cross currents. To the east across the Trisuli gorge lay the twin peak of the Lirung still half-hidden in a white snow cloud, and to the north lay the high snows of Tibet intersected by deep valleys; we could just see into the upper Trisuli valley and the terraced fields of Kyirong. The Tibetan plateau lies some way behind the main Himalaya range at this point, and steep valleys cut across the subsidiary ridges. To the south lay roll upon roll of lower hills flecked with white clouds which disappeared into a purple haze of heat, over the far-away plains of India, while at our backs immense cumulus clouds towered thousands of feet into the air above the high peaks of the Ganesh. It was very rarely that we were vouchsafed such a magnificent and extensive view in this country of mists and rain.

By August we were once again at our old camp at Langtang village. Many changes had taken place during the intervening month. Tall Docks and yellow Balsams lined the stream sides. The long meadow grass was now bright with Aster, Lotus, Parnassia, Saxifraga and *Notholirion macrophyllum*. Ground Orchids such as the green *Hemerium* (Musk Orchids), the pink spikes of *Satyrium nepalense*, and the pink and white spirals of *Spiranthes* were also conspicuous. The women and children were now harvesting the Wheat and Barley, by the simple process of walking through the fields and pulling off the ears by hand. Threshing with the flail was also in progress and on sunny mornings one could hear the rhythmic beat of the flail echoing across the valley from rock wall to rock wall. The Buckwheat was turning a rich autumnal red. Much of my time was now spent collecting birds, as the gun and cartridges had at last arrived after many delays, but the last week of August and the first of September were spent seed collecting. It was obviously too early in the year for an extensive collection but I was able to get a small quantity of seed of some Primulas, Meconopsis, Leguminosae and Compositae; even in these cases it was a question of selecting

only the ripened capsules. Gentians, Delphiniums, Monkshoods, Saxifrages, Cyanantheses, Rhododendrons were in many cases still in flower and at least another month would have to pass before seed was ready for gathering.

The last days at Langtang were spent in feverish activity drying and cleaning seed, packing the last herbarium specimens in specially provided wooden boxes and filling and packing bird skins. The other members of the party had already left the valley and so on September 10, in company with the Nepalese Lieutenant, a Sherpa, a skinner and six coolies, I started on an eight-day march over the 18,500 feet Ganga La pass into the headwaters of the Kosi river. The watershed separating the Kosi from the Trisuli rivers lies along the Gosainkund ridge and the ridge immediately to the East of this was the shortest route to Katmandu. A gradual descent took us once again through the successive zones of vegetation to the terraced hills of the Lower Malemchi Khola, amid Maize and Rice, ripe for the autumn harvesting. A further climb over the Sheopuri hills brought us down to the fertile, prosperous valley of Nepal where we were able to indulge in a few days of civilized life before returning to England.

In conclusion I should like to thank all those who made it possible for me to participate in this unique journey, which I have described so briefly; in particular I should like to thank DR. G. TAYLOR, MAJOR H. W. TILMAN, the Governing Body of Charterhouse and the Trustees of the British Museum.

SOME FAMOUS IRISH GARDENS

G. S. Thomas

PART II

THE following morning I went to Glasnevin Botanic Garden, just out of the City, and it was good to find it in such good order and the wonderful collection of plants there so little altered. I unfortunately had to go round alone, as MR. WALSH was out, but my tour was amply repaid. From sixteen acres purchased in 1795 the garden now has grown to forty-seven acres and is packed full with trees and shrubs and plants, many tender species being grown under glass. The Deutzias were in full bloom and *D. purpurascens*, *D. globosa*, and *D. kalmiaeflora* among others were particularly good. The garden is sadly cramped but bed after bed of good things along the winding walks contained interesting collections. Bees were busy on *Ptelea isophylla* and several species of Pittosporum were showing their plum-coloured starry blossoms. The Conifer collection was just at its best, for the young foliage brilliantly lit up the golden and glaucous varieties. The magnificent specimen of *Cedrus atlantica glauca pendula*, sharply contrasted by the typical blue type behind, was a remarkable sight.

The double herbaceous borders contained some unusual plants and amongst them I remember the bright yellow Onion, *Allium Moly*, and

Hedysarum coronarium. The rock garden was full of interest, fine groups of *Cypripedium Reginae* (*C. spectabile*) (Fig. 169), *Roscoea cauleoides* 'Bee's Dwarf,' *Erodium alpinum*, *Aphyllanthes monspeliensis*, *Pimelias*, etc. were all in flower, and a good plant of the rare Gentianaceae member, *Clintonia Andrewsii*, was showing its rich mahogany blooms above broad foliage. It was a pleasure, too, to wander through the beds devoted each to a botanical family and to catch snatches of botanical conversation from fresh-minded youngsters who flocked in while I was there: Trinity College undoubtedly has some keen students!

On the little peninsula just north of Dublin lies Howth Castle, the home of MR. T. J. GAISFORD ST. LAWRENCE, standing on rising ground, and approached by an avenue of Irish Yews set in a wide grass verge. MR. JAMES RUSSELL, the manager of the demesne, kindly met me and later provided me with MR. DONOVAN as a guide to explore the Hill, and I was most grateful for being permitted to interrupt their Sunday afternoon. In the forecourt of this tall, grey, ancient and battlemented building is a tree stump and crown of branches surrounded by masonry. It is an English Elm and was planted in 1585. Contained in the angle created by the road and the drive lies an area surrounded by two Beech hedges, each 27 feet high and about 16 feet through the base, tapering upwards to a rounded top. A grass path runs between them. These hedges were planted early in the seventeenth century, MR. RUSSELL told me, and their splendid condition and smooth sides are a great tribute to those who tend them, and provide a good background to the several fine shrubs about them, notably a very fine *Cornus Kousa* and *C. macrophylla*, both of which were in flower.

On the south side of the Castle are many sun-loving shrubs, a fine Banksian Rose of the double yellow variety, *Mandevilla suaveolens*, *Solanum jasminoides*, *Salvia Greggii*, *Lonicera Tellmanniana*, Myrtles and a good large rounded bush of *Pittosporum Tobira*; this particular specimen had leaves edged with pale yellow and the contrast of green and yellow and the maroon flowers was very telling against the grey walls. A projecting wall on the west end of the building nurses a little enclosed formal garden reached through a heavy door and a vivid scene meets the eye. The area is intersected with flagged paths and a glorious mixture of homely flowers and a few shrubs give a long display of colour. Here were Nepeta, Lavender and Rosemary, Delphiniums, Peonies, *Inula Roylei* and *Geranium ibericum*, Agapanthus, and under the shade of a large *Buddleia Colvillei*, the rare *Bergenia ciliata*. Two fine foliage plants noted were *Cynara Scolymus*, the Globe Artichoke, and *Melianthus major*, a mound of large, pinnate, toothed leaves in soft sage green, the plant covering 8 feet square of ground and rising to 4 or 5 feet in height. In late summer this produces spires of beetroot-coloured flowers. On the walls were Fuchsias of the *magellanica* type, up to 12 feet high, and *Hydrangea petiolaris* in full flower on the wall.

Beyond this charming enclosure there is a *Paulownia imperialis*, and a very pleasing and restrained planting of shrubs in simple borders, and some specimen trees lead to a small lake.

The south front commands a view across a wide lawn terminated by trees at each end, which frame the distant landscape. Beyond gently



Colour transparency, J. F. Downton and

FIG. 154 —Peacock Moraeas (See p. 325)

M. villosa *M. gigandea* var. *purpurea* *M. villosa* — Best purple
M. pavonia var. *magnifica*



Photo: W. Abbott

CHILSEA SHOW, 1950

FIG. 155.—A Rock Garden by Misses WORTHINGTON, for which a Gold Medal was awarded



Photo 11. Do not read

CHILLSEA SHOW, 1950

FIG. 156. A Formal Garden by Messrs R. W. Waller & Co., for which a Gold Medal was awarded.

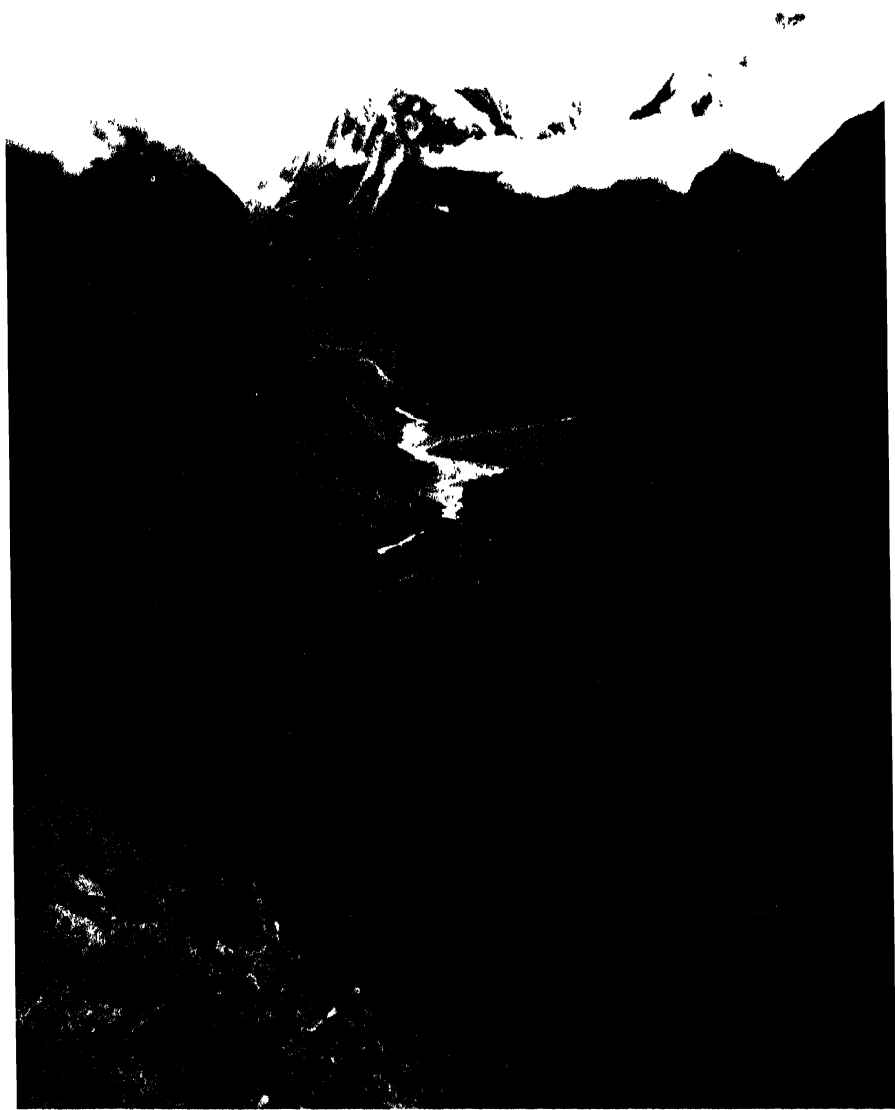


Photo: O. Pichler

FIG. 157—The Mountains of Nepal—Upper Langtang Valley



PLANT COLLECTING IN NEPAL

FIG. 158 *Primula obliqua*, *Rhododendron campanulatum* and Birches (See p. 310)



FIG. 159. *Notholimon macrophyllum* (See p. 307)

PL.

FIG. 160. *Mecynopsis paniculata* (See p. 307)



FIG. 161 *Saussurea gossypiphora*
(See p. 311)



FIG. 162 *Cromanthodum plantaginifolium* (See p. 311)
Seed capsules of *Primula macrophylla* (left)





FIG. 163—*Delphinium Buxifolium* (See p. 312)



PLANT COLLECTING IN NEPAL
FIG. 164—*Thermopsis barbata* (See p. 307)



FIG. 165. View from the South front at Headfort. (See p. 320)

SOME FAMOUS IRISH GARDENS.



Photos G. S. Thomas

FIG. 166. Yew arches at Headfort



FIG. 167—Rhododendrons on Muck Rock, Howth peninsula. (See p. 317.)



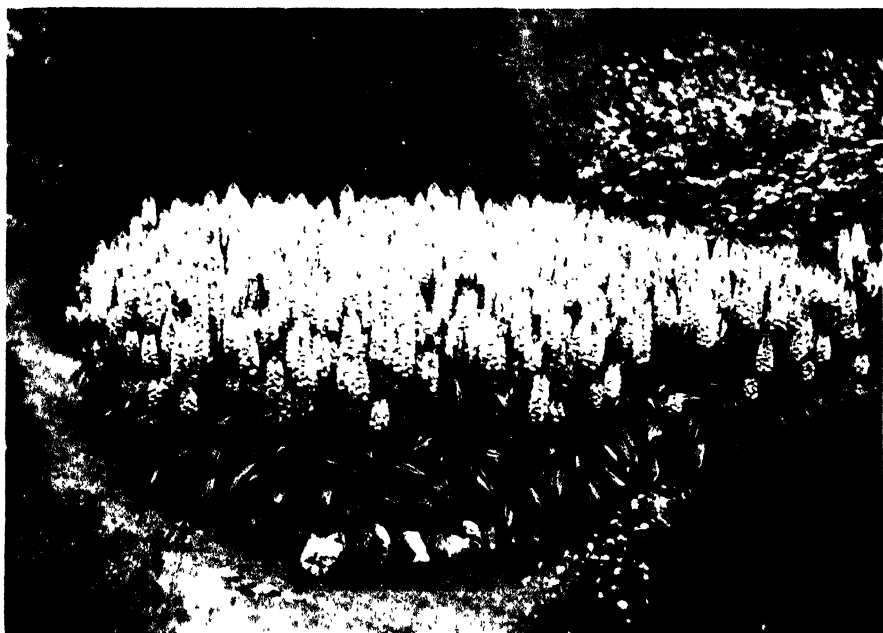
SOME FAMOUS IRISH GARDENS

FIG. 168--A part of the Garden at Howth Castle.



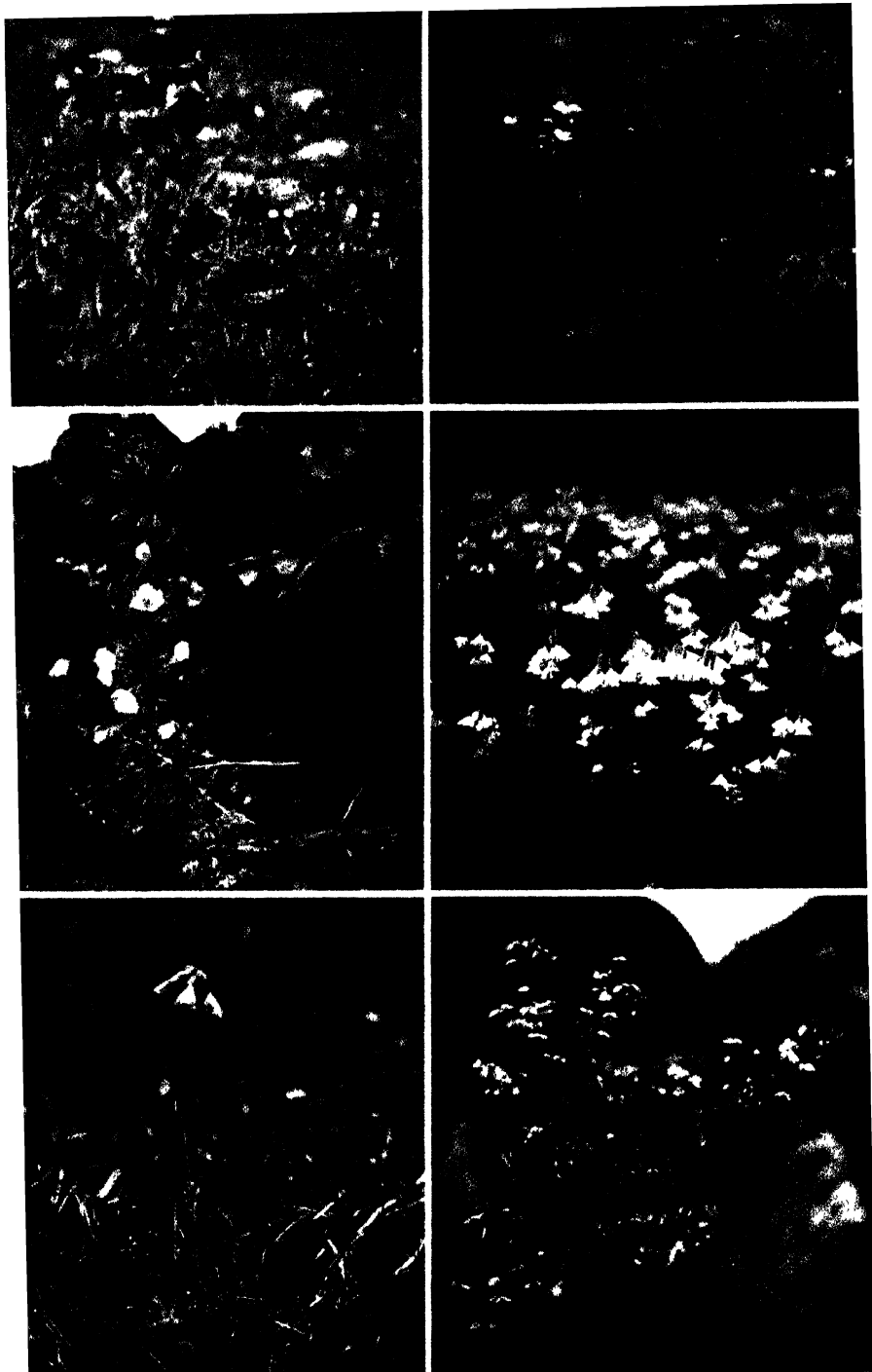
SOME FAMOUS IRISH GARDENS

FIG. 169—*Cypripedium Reginae* at Glasnevin. (See p. 316)



NINETY YEARS A GARDENER

FIG. 170—*Orchis foliosa*, the Madeira Orchid, in CAPTAIN PINWILL'S Garden (See p. 330)



low photographs, O. Polunin

PLANT COLLECTING IN NEPAL

- FIG. 171- (top left) *Meconopsis discigera* (See p. 313)
 FIG. 172 (top right) *Delphinium* sp. near *D. denudatum* (See p. 308)
 FIG. 173- (middle left) *Meconopsis longipetiolata* (See p. 312)
 FIG. 174 (middle right) *Primula sikkimensis* forma *Hopiana*
 FIG. 175 (bottom left) *Primula Wollastoni* (See p. 310)
 FIG. 176 (bottom right) *Thalictrum Chelidoni* (See p. 307)

rising meadows is a hill about 150 feet high called the "Muck Rock." The lower part of this long promontory is shrouded with trees, but the top, rising above them, is covered with the rosy mauve of *Rhododendron ponticum*. At that distance it might have been taken for heather, so smooth and solid was the colour.

We set off along the footpath across the meadows, soon entering a lengthy spinney of native trees and some flowering Cherries. After many minutes' walk I felt we must be getting near to the foot of the northern escarpment, and suddenly we reached a clearing under arched Beeches. I cannot do justice to the splendour before us; the steep slope of the hill, at an angle of less than 45° , was a sheet of colour from the lush grass on which we were standing up and up for a hundred feet—dome upon dome of brilliant Rhododendrons many 15 feet high and wide, from white to pink and mauve, purple, carmine and scarlet, veiled here and there with a slender Larch or leaning Oak. Above these we could see the lower portion of the ponticums; the top of the hill was out of sight. Being a north slope the light met us from over the hill and lit every flower with an enhanced brilliance, and the plants themselves were thriving exceptionally because of that cool slope. (Fig. 167.)

Strangely enough the rock is a limestone but the peat covering all but the crown is rich and deep, and is kept permanently moist by the sea mist, known locally as "Lord Howth's nightcap." The plantings were started after 1850 and have been continued at intervals ever since.

Many old friends among the hardy hybrids were there, and later plantings include some of the yellow species and others of newer colours and a very noteworthy specimen was *R. Edgeworthii* which MR. RUSSELL tells me is over thirty years old and flowers regularly. *R. Thomsonii*, and *R. 'Victorianum'* were also present in grand specimens. Stretching along the damp soil at the foot were more Rhododendrons, Tree Ferns and *Primula helodoxa* lighting the way to a cromlech hidden amongst the trees, the top stone of which is reputed to weigh 70 tons.

Many walks lead one to the top; winding this way and that and intersecting, yet ever going upwards. We stopped now and again to take breath at vantage points from which fresh views are provided either down or along the massed colour. Eventually we left the hybrid sorts and reached the ponticums; this natural and pure generation goes ever upwards, the paths in many parts being through dark tunnels of inter-lacing stems with a canopy of leaves and flowers above, but the very top of the hill is bare rock and short sward. The view from here over the steeply falling carpet of colour down to the tree tops, across the meadows to Howth Castle nestling amongst its belt of trees, and then to the sea and Lambay Island, is one of rare beauty.

My next call took me many miles south, through glorious country with ranges of Ireland's softly moulded mountains first on one side and then on the other, past Cashel and Cahir, to Annesgrove, Castletown-roche. Both this and Glasnevin have some lime in the soil, which, needless to say has a profound effect on the vegetation. Annesgrove is a remarkable garden on several levels and MR. R. GROVE ANNESLEY has made full use of the natural scenery.

The long roadway through the estate brings one to the very homely

picture of the wide drive before the square and comfortable old Georgian house, and on the left a lawn sloping upwards, curtained at the sides with typical parkland trees, Copper Beeches, Elms, some huge *Rhododendron ponticum* covered with mauve blooms and a young Cedar to hand beauty down the years. On the house walls are *Actinidia chinensis* and *Kolomikta*, *Schizandra rubriflora* and *Clematis Armandii* 'Apple Blossom' and at the back is a plant of the rare old Noisette Rose 'Champney's Pink Cluster.'

Following the drive past the house one goes through a grove of stately Beeches, and has a softly lit view over the river deep below, where grey-leaved Willows (*Salix alba argentea*) have been freely planted; their feathery, silvery tops stand out in a remarkable way amongst the green and varied vegetation. On the left of the drive was a specimen of *Cornus Kousa chinensis* and another of *C. controversa variegata* just at its best and showing the light beauty of its white variegated foliage, tier upon tier, up to some 25 feet. These two *Cornus* varieties were in nearly every garden I visited but MR. ANNESLEY'S specimen of the latter was the most stately I saw; it is unfortunate that this tree is so difficult to propagate for it is a plant of the greatest beauty, and lacks the bizarre effect of most variegated shrubs.

Passing through a door set deeply in a wall we entered a charming garden on higher ground in part devoted to an informal grouping of handsome plants—Rogersias, Primulas, Meconopsis, *Lobelia laxiflora angustifolia* (*Cavanillesii*), and *L. Tupa*, in a rock and water setting, amongst Cherries and compact flowering shrubs, with something fresh at every turn. The rest of the area is given to lawns and formal planting and very fine was the promise of the double herbaceous borders and large groups of good Lilies. *Lilium monadelphum* and forms were looking well in old-established clumps, their light canary yellow showing afar against the dark green of the hedges. The main cross-vista is enhanced by rows of round beds connected by long borders of raked earth; this was a "new" type of gardening for my travels, and the rich filling of Pansies and Sweet Williams very suitably decorated this period piece. Crossing this one mounts to a summer-house and across the lawn were seen splendid spikes of the new Pacific Strain of Delphiniums.

I began to feel that I was in a richly endowed garden, but we had only just begun. We left the walled garden and went down the steep side of the river valley, looking up at the yellow *Genista cinerea*, hanging over the purple *Geranium ibericum*; trying to count the showy clusters of flowers on *Stranvaesia Vilmoriniana*; looking up at hundreds of blooms on *Magnolia sinensis*, those waxen white inverted saucers beset with maroon centres. Then again, *Styrax Obassia* and *Deutzia Wilsonae* were in full bloom, and Kalmias were in bud. This rich planting along the deep sloping soil of the meadow was carried to the very edge of the limy river, whose banks are planted with great clumps of Japanese and Siberian Irises, Funkias, Hemerocallis, *Peltiphyllum* (*Saxifraga*) *peltatum*, Rodgersias, *Libertia formosa* and Arum Lilies. Primulas by the hundred including a veritable forest of *P. helodoxa* were there in many places, seeding themselves. Also thoroughly at home and sowing itself was *Lysichiton americanum*, the hardy yellow Arum whose great broad

leaves, up to 5 feet high at the time of my visit, added their lustrous green to this complexity of textures, enriched by the giant metallic green swords of Phormiums, the carved filigree of two noble ferns (*Lomaria antarctica* and the Royal Fern *Osmunda regalis*), mighty Gunneras and whispering graceful Rushes.

The River Aubeg, the rippling foil to all this variety, forms several islands as it winds through the property, deep in its bed between the grey cliffs, hung with ivy. Little did EDMUND SPENSER, writing his "Faerie Queen" in honour of GLORIANA along what he called "The gentle Mulla," dream of the richness that would one day be gathered from all over the world to grace these banks!

Our last hours together were spent in looking at two varied plantings of Rhododendrons, for MR. ANNESLEY was fortunate in discovering that he had two pre-historic river deltas of gravel overlaying his naturally limy soil, which have made ideal homes for these shrubs. Interplanted with such good things as *Magnolia obovata* (*hypoleuca*), Embotriums, Oxydendron, Nothofagus and Maples, Rhododendrons of all types thrive, in a natural woodland setting. RR. 'Lady Bessborough,' remarkable *Keysii* with its narrow orange tubes and projecting stamens, triflorums in all colours, mauve and grey *oreotrephe*s, *Griersonianum* and many of its hybrids, *litiense*, *haematodes* were all in flower, but most vivid in my memory remains *R. cinnabarinum* in a particularly vivid orange form, giving a strong contrast to the young foliage of glaucous blue. *R. Wardii*, *croceum*, and the large leaved *Falconeri* and *grande*, *fulvum* and *Thomsonii* gave beauty with their lovely foliage, while beneath, Kurume Azaleas are grouped. The sudden contrast of soil is specially noticed in the Hydrangeas which here develop a vivid blue, while near the house they remain pink. I left the garden when we could see no more and drove out through another drive lined with a collection of stately Abies, Piceas, Cedars, and Douglas Firs.

I arrived back in Dublin the next day in time to call at Willbrook House, Rathfarnham, the home of SIR FREDERICK AND LADY MOORE. SIR FREDERICK has now alas! passed on, leaving with us many fine plants and trees both here and at Glasnevin, and a horticultural record of indelible memory. This quiet and homely place of two or three acres, on slightly limy soil lies just off the busy road and is approached by a short drive planted with a varied collection of trees, amongst which I well remember the Coral-bark Maple* ('Sango Kaku') *Podocarpus nubigena*, *Prunus yedoensis*, the tall, tapering, Silver Pear (*Pyrus salicifolia*, not the weeping form more usually seen), *Nothofagus Dombeyi* and *antarctica*, *Abies nobilis* and *magnifica*, all young vigorous specimens in the best of health and like the rest of the garden treasures, planted mostly after 1925. A graceful young *Picea Breweriana*, hung to the ground with its grey-green tresses, *P. Omorika*, and a collection of Magnolias including *M. Watsonii*—scenting the air with its rich perfume—*salicifolia*, *Delavayi* and others, *Viburnum grandiflorum* 13 feet across, Hamamelis, and *Salix Fargesii*, noted for its brilliant winter buds, are also in this gathering. The view between two venerable

* This is the plant which received an A.M. when shown on February 14th, 1950. It is described on p. 334.

Beeches of the smooth lawn, with the evening light on the rounded low forms of Japanese Maples on the far side also lives with me. Nearby a specimen of *Jasminum Parkeri* 3 by 4 feet is in full vigour on the rock garden. Another great Beech has been underplanted with a collection of grey-leaved herbaceous plants and shrubs; considering that the Beech takes surface moisture and wards off the rain, and that the aspect is full south, it is an admirable solution for such a drought-ridden spot. The planting includes *Senecio laxifolius*, *S. Cineraria*, *Phlomis*, *Artemisia pyramidalis*, *A. Stelleriana*, *Centaurea Clementinae*, *Convolvulus Cneorum* and *Santolina Chamaecyparissus*. A small rocky bed is given mainly to a great carpet of *Dryas octopetala*, all from an original root collected in the mountains in Dublin County.

Not far away were fine shrubs of Scots Roses and the rare Rose called *dianthiflora*, so like the Grootendorst rugosa Roses, but not their forerunner, also the 'Rose d'Amour' (*R. virginiana plena*), *R. Ecae* and the true double type of *R. xanthina* itself (known also as *R. Slingeri*). Tree Peonies 'Souv. de Maxime Cornu' and 'l'Esperance' guard the entrance to a grass walk back to the drive, where, in the partial shade, *Rosa Farreri* and *Hillieri* were covered with bloom; here also was LADY MOORE's special plant of 'Souv. de St. Anne's,' a single type of the old Bourbon Rose 'Souv. de la Malmaison.' This occurred as a sport from the original in the garden of the late LADY ARDILAUN at St. Anne's, Co. Dublin.

On the south side of the house are sunny borders containing *Amaryllis Ackermannii*, *Rosa mirifica*, and a notable specimen of *Carpentaria californica*, some 7 feet high and wide. This was grown, LADY MOORE told me, from seed from the late MR. EDWARD WOODALL's garden at Nice; the flowers are very large, borne usually in fours, and have an extra petal or two. Around the kitchen garden are flower borders containing herbaceous plants of unusual quality; I remember particularly the huge clumps of the rich magenta black-eyed *Geranium armenum*; *Senecio doronicifolius*; noble-leaved *Bergenias* (*Megasea Saxifrages*) and *Hostas*, *Lilies*, *Heucheras*, *Aster Forrestii*, *Camassias*, and *Peony* species and hybrids; on the walls around were the silvery seed heads of *Clematis macropetala*; *Stauntoria hexaphylla*, *Ceanothus*, *Abeliophyllum distichum*, *Ribes laurifolia*, etc. Away across the meadow a marginal walk includes more good shrubs and a remarkable selection of Scots Roses in all colours; in particular the rich plum-coloured variety with reverse of lilac-grey, attributed to Mary, Queen of Scots.

Near the historic little village of Kells, north of Dublin, lies the Headfort estate. Here again the weather was kind and LORD HEADFORT spent many hours taking me round the magnificent collection of trees and shrubs mostly gathered together by his father. The south prospect from the mansion looks over a unique semicircular grass parterre; it is intersected by gravel paths, punctuated by a remarkable series of clipped Yews, and bounded by a castellated hedge. (Fig. 165.) From the severe formality broken up in this arresting way the eye travels over rich parkland, set with scattered trees, and in the middle distance one sees the tops of the notable collection of Conifers on the island. At the right extremity of the terrace is a thicket of *Thuja plicata*; on closer acquaintance one finds

it to be a self-layered forest of stems all from one original root. On the left the drive leads along borders of Roses and shrubs and herbaceous plants to a grouping of Rhododendrons amongst which I vividly remember a grand specimen of *R. orbiculare* about 11 feet high and 13 feet wide; also *Lindera Benzoin*, *Cercidiphyllum*, *Styrax japonica*, and incidentals like *Arisaema erubescens*, a stately arrow-leaved Arum of some 4 feet hooding its spadices with rich brown spathes. A short car journey over the meadows brought us to the island; it stands in the midst of a lake or wide part of the River Blackwater, and its sheltered lowland conditions and rich alluvial soil have given rise to some prodigious growth amongst the Conifers and interesting trees and shrubs planted between about 1880 and 1935. The trees are unimpaired by the neglect of the war years and we spent some hours walking under immense Douglas Firs and *Abies grandis*, Wellingtonias and Redwoods, *Pinus radiata* and *Cupressus macrocarpa*. There were some particularly fine *Picea Omorika*, and *Abies grandis* had grown over 3 feet per year in some places. Less well-known kinds include *Tsuga heterophylla*, to my mind one of the most beautiful of all Conifers; *Pinus patula*, *Ayacahuite*, *Montezumae*; *Abies Georgei* and *Veitchii*, also Widdringtonias, and Dacrydiiums. In short, this is a Pinetum of very great importance and interest; scenically it is nothing short of inspiring—the great Conifers tower above all else and it is an education to go round and see the trees in what must be their natural vigour.

This island is by no means given entirely to Conifers; we were fortunate in finding *Fraxinus Paxiana* in flower, perhaps the most ornamental flowering Ash, well covered within its grey-white foamy flowers; *Sorbus Folgeneri*, the most graceful of the Whitebeams in its best form with narrow leaves, glaucous beneath, and arching growth. *Rosa Moyesii* had reached some 12 feet and we walked under its filigree foliage, starred with blood-red blooms against the blue sky; *Staphylea holocarpa rosea* and *Malus yunnanensis*, I remember too, and I was particularly interested to see *Helleborus corsicus* happily naturalized under a Douglas Fir.

The surrounding estate is luxuriantly wooded and in selected spots plantings of Rhododendrons have been made and every now and again some fresh Conifer rears itself up through the superb native Sycamores, Beeches, Oaks, Ashes and Hornbeams.

On the other side of the house lies a large walled garden with rows of Wellingtonias and Irish Yews, and specimens of Conifers and deciduous trees. Several excellent Magnolias were there: *M. Veitchii* 30 feet high and wide, *M. Dawsoniana* of equal width and 20 feet high, *M. grandiflora* and *salicifolia*; *Davidia involucrata*, *Nothofagus Dombeyi*, and *Liriodendron chinensis*. Great contrast of foliage is provided by these broad-leaved trees and wide clumps of *Phormium tenax* against the Conifers. Noted specimens include *Libocedrus chilensis*, *Pinus parviflora glauca*, *Cupressus Duclouxii* (40 feet), *C. formosensis*, *C. Lawsoniana Headfortii*, *Tsuga Sieboldii*, *Arthrotaxis cupressoides* (25 feet), and the rich green *Podocarpus chilina* (20 feet).

Beyond are the greenhouses and nursery area, where an ancient Yew hedge, arched and cumulous shaped with wayward age, leads one to a

little garden house where records of the garden's successes are kept, and signatures and photographs of visitors are to be seen.

The next day I left Ireland after a period of mostly glorious weather and intense enjoyment at all the beautiful places and country that I saw and I should like to place on record here the very great kindness which was shown to me by the many enthusiasts whom it was my privilege to meet, and who gave me so much hospitality. With so much before me I had to fit in visits when and where I could and it is my regret that there were so many great gardens which I could not visit owing to the distances involved and lack of time.

I have been asked several times which of all the gardens I saw did I consider the finest; an inevitable question perhaps, and one which might seem an easy task. Apart from the consideration of mere size I could not give an answer. On looking back at them one is struck how each of the larger places has approximately the same main features—the immediate house surrounds, terraces, etc.; the walled, or formal part; and the free plantings of trees and shrubs—but that each feature, having been moulded by a different mind and in different natural settings (in respect of soil, aspect and altitude) is in no two gardens alike. And so my memory chiefly speaks to me of the landscape planting at Rowallane, where MR. MOORE has suited the plants to the landscape and welded them into a harmonious whole; the magnificence of the specimens at Castlewellan; LADY LONDONDERRY'S catholic taste in plants coupled with richness of design and ornament. Then in the South the imposing of man's firm design upon nature at splendid Powerscourt; the satisfying homely beauty of MISS RIALI'S quiet formal garden; Mount Usher, where one of the finest collections of hard wooded subjects in these islands finds a beautiful and congenial home; the National garden at Glasnevin, an inspiration in almost every aspect of horticulture; Howth Castle and its curtain of Rhododendrons; the silver tops of the willows in the river valley at Annesgrove and the "home" feeling in the walled garden; the store of knowledge and selection at Willbrook, and the monumental Arboretum at Headfort. Each in its way is supreme in its kind, and lest it should be thought that I was only impressed by the greater places let me also state that the three smaller gardens, their keen owners and interesting plants, remain just as firmly in my mind.

The tradition of gardening in these islands—for in horticulture, at least, I think I may say that the tradition and skill are one throughout the four nations—is worthily upheld in Ireland. The war did not hit the owners so hard even in Northern Ireland as it did over here, and I found the upkeep in general to be of a very high order, and it is I am sure the hope of everyone that conditions over in Ireland may enable these great and inspiring places to remain so. Inevitably it is the gardens or areas where nature is governed most strongly that most quickly suffer from lack of attention. Coarse weeds and even trees seed into cracks of masonry and paving with dire results; coarse grass grows where smooth lawn and trim beds were and gravel paths become a weed-strewn disgrace. An army of gardeners is needed for renovation and upkeep, and such remedies are, in present conditions, no longer possible. But let us not despair, for in these islands we can have a rich and varied

beauty from the innumerable wild trees and shrubs introduced during the last century or so, and plantings on a big scale are possible with very little labour as at Howth and Headfort. Furthermore, I would say that such plantings, where the eye ceases to worry over weeds in beds and borders, may do incalculable good to minds of men, carrying the eye aloft in refreshment and recreation; and in planting for posterity, much satisfaction can be gained, to the permanent enrichment of our countries.

PEACOCK MORAEAS

T. T. Barnard

MY collection of *Moraeas* dates from an August afternoon in 1926 when, shortly after my arrival in South Africa, I found the blue *M. tripetala* and the dwarf orange *M. papilionacea* flowering together by the roadside some few miles out of Cape Town. For the next eight years I collected and cultivated Cape Iridaceae and especially *Moraeas* and the scented *Gladioli*. My collecting area was confined to a radius of approximately 100 miles from Cape Town and my collecting time to short or long week-ends. As my interest strayed from year to year to *Watsonias*, *Geissorhizas*, *Homerias* and *Aristeas*, I cannot claim to have made anything like a complete collection of any genus. When in February 1933 I returned to England, I brought the bulk of my collection of Cape Iridaceae with me. They found a temporary home in a garden on the Bargate sands near Godalming and in the following Autumn they were moved down to Dorset. Here I had constructed two small greenhouses and in these the collection has survived with very few additions but innumerable subtractions for the last sixteen years. The collection to-day consists only of the Peacock *Moraeas* and the scented *Gladioli*. Pressure of space and the war years led me to discard from the greenhouses all the fugacious flowered *Moraeas* and all the other genera. The early months of 1940, mice, weeds and wartime neglect have exterminated almost all the plantings of Cape Bulbs that I made outside.

But in one greenhouse, the scented *Gladioli* continue their struggle against dry rot and the other diseases to which this most desirable genus seems particularly prone; and in the other house, the *Moraeas* flower and increase and provide for five or six weeks the maximum of floral splendour for the minimum of trouble. There does not seem to me any difficulty about the cultivation of these "Cape Bulbs." But I have no doubt that my success with them here is due mainly to my knowledge of their home conditions and that in designing two greenhouses for their cultivation in this country, I made a few lucky guesses as to what would suit them and myself best. The houses are about 26 feet long with a ridge roof and are sited North and South—and with both top and side ventilation, running the whole length on each side. A central concrete path is flanked by two raised beds about 2 feet 6 inches wide. These beds are filled with a gritty sterilized soil on top of a layer of rubble drainage. I am sure that a fairly wide range of soil mixtures

can be used for Cape Bulbs—but the mixture should be neutral to sub-acid and the texture open enough to give sharp drainage but not so sharp that it will dry out during cold spells when watering is impossible. Corms are planted in a layer of sand, set closely in rows about 5 inches apart, that is, wide enough to get a hand or a nozzle of a watering can between them. Corms of *Moraeas* should be lifted and replanted at least every three years. This should be done in August so that the beds are ready for their first soaking about the middle of September. From then on the plants must be kept growing steadily until flowering time (March–April), after which they can be dried off fairly rapidly; and when the seed has been collected the plants can be left alone with full top ventilation to bake throughout the Summer until replanting or restarting is due.

My greenhouses were provided with pipe heat originally, but for the last nine years—and this includes the severe Winter of 1947—they have had no heat at all. Grown in beds in a greenhouse with adequate ventilation control, they are better without heat. I see no reason why in the South of England they should not be grown—though with rather more trouble perhaps—in cold frames. They will, I believe, tolerate a wide range of growing conditions and there are only two things of which I am certain: Peacock *Moraeas* cannot be grown satisfactorily out of doors even in the most favoured situations and they cannot be grown satisfactorily in pots in a heated greenhouse among other plants and crops. For the successful cultivation of the less domesticated Cape Bulbs a special house is required for plants that enjoy a Mediterranean climate, where they can be kept growing throughout the Winter and abandoned to bake throughout the Summer. There is no reason to confine such a house to Cape Bulbs or the flowering season to a six weeks' display. With some variation of soil to suit the sand, the lime and peat lovers, a wide range of Mediterranean, Cape and Californian Bulbs can be grown in such a house. I find my house and house treatment suit many Palestine plants, *Oncocyclus* Irises and other Iris, Tulip and Crocus species, etc. And it should be possible to have some flowers from November to May, even if the house is confined to Cape Bulbs. This fascinating group of plants, whose portraits fill the early volumes of the *Botanical Magazine* will not be seen again in this country unless a few enthusiasts are prepared to build or convert a greenhouse for their cultivation. They only demand two things—a little attention to protect them from the extremes of their Winter growing season, September–March, and to be left severely alone in the soil to bake throughout the Summer, May–August.

Those are the two essentials. Soil composition and the control of temperature and moisture depend within fairly wide limits on the convenience of the individual grower and the site where they are grown; and protection from greenfly, red spider, woodlice, etc., is normal greenhouse routine. In summary, my advice to any would-be grower of *Moraeas* is: plant them under glass, start them early, do not coddle them and hope for the best.

M. villosa and all its varieties and hybrids have to be grown in separate plots bounded by slates sunk 5 to 6 inches into the ground, because this species increases by corms formed on lateral stolons several

inches from the parent corm, and without an impermeable barrier it is impossible to keep the varieties apart. All my *Moraeas*, therefore, are grown in slate-bounded plots and a short description of some of the main plots will give the best summary of the collection as it exists to-day.

Old *M. villosa* mixture. This is the greatly reduced remnant of the numerous "villosa" varieties that I collected from different local colonies between Cape Town and the northern limits of the Ceres plateau. Many of these were thin in petal and washy in colour and during the course of years have been discarded. There survive a few of the originals and a certain number of seedlings raised here.

Some half-dozen plots of special *villosa* varieties have been retained. They include the very distinct dwarf variety from the hill behind De Grendel House, near Milnerton, the nearest to Cape Town of my "villosa" sites, and three very distinct forms from the Picquetberg District, a small-flowered blue-lilac, a tall rosy lilac with the "eye" reduced to a small black spot and a very startling hot magenta with a royal blue "eye," also from Picquetberg, which has given some nice hybrid seedlings especially with *M. glaucopis* the Peacock Iris of the Dutch Catalogues.

The best purple "villosas." This large plot contains several hundred corms of about twelve seedling forms, that have a long history. They came originally from a famous private collection that was presented to Kirstenbosch Gardens about 1929. The collection contained some magnificent varieties. Alas, it has long ago disappeared from Kirstenbosch! But I took—PROFESSOR COMPTON always maintains I stole—some surplus seed in 1932 and this was raised for me by my friend MISS STANFORD and about half the resulting seedlings were sent to me after my return to England. Among them were these "best purples" which are stiffer in the petal, more perfectly shaped and more intensely coloured than any of my own "villosas."

M. pavonia. My small surviving stock of this *Moraea* all came from Thunberg's type site by the old ford across the Berg River on the borders of the Picquetberg District. The colours vary from yellow to chrome orange always with a royal blue eye. It is far surpassed by its variety "magnifica" (Fig. 154) which is shorter in the stem but with larger flowers of an intense chrome orange. I had heard of the existence of this variety but I never found it in flower. In late September 1933 after the *M. pavonia* were over I was collecting further down the Berg River and found four or five new colonies of the species in seed from each of which I took half a dozen corms. None of these flowered until 1937 but among them were a few of this extra fine variety.

M. pavonia hybrids. A mixed lot of yellow orange and buff forms of *M. villosa* × *M. pavonia* of varied origin, some being from the Kirstenbosch collection, some from MISS STANFORD and some of my own raising; a few are probably derived from the other orange-flowered species *M. tulbaghensis* a much less showy and less desirable species than *M. pavonia*.

M. gigandra. My first examples of the white type of this species were given to me by MRS. BOLUS in 1928. I received others later from my friend MRS. STIFF of Picquetberg. I only once saw it in flower in

its native habitat and that on a farm where it was quite rightly strictly preserved. But I received seed from these plants and I have raised others here since and a large number of inevitable hybrids.

M. gigandra var. *purpurea*. I collected a few corms of three slightly different varieties of this beautiful plant and I received others from private collections. Of two large batches of seedlings raised here at least 80 per cent. were hybrids and my stock of pure var. *purpurea* has always been very limited.

M. gigandra hybrids. Some of these are very lovely, especially perhaps the crosses between *M. pavonia* and the white type which have given large flowered forms in orange salmon and deep yellow with the *pavonia* royal blue eye. Large numbers of *villosa* crosses with the purple variety are also all nice plants. The only failures have been the crosses between the type and the purple variety which are all washy lilacs and with the persistence of the unwanted, keep on cropping up among their betters.

I harvest a fair amount of seed every year and though I have only sown small quantities myself I have distributed several million I suppose, but always with the proviso that I cannot guarantee the results. All my *Moraeas* flower at about the same time and on fine days the house is humming with flies and bees—the latter, especially the humbles, doing more damage than good.

The raising of new varieties from seed is rather a long process, three to four years. My collection to-day though it contains fewer varieties, is as numerous as it ever was, and only two or three small plots can be reserved for seedlings coming on. I have preferred in recent years to devote the available space to larger stocks of selected kinds rather than to small lots of every possible species and variety. There have been very few additions during the last ten years and the collection that began as a botanical one, must now be regarded as horticultural and mainly composed of garden hybrids and seedlings. The Peacock *Moraeas*, derived as they are from some five or six species all of which are very variable in their native areas, owe their chief appeal to the endless combination of colours that they exhibit. Hybridization has added considerably to the range of form and colour and I hope that there is a future for these hybrid *Moraeas* in those countries, including their own South Africa, where they can be grown in the open; and here in England although their cultivation must be confined to the few enthusiasts who are prepared to give them the greenhouse protection that they demand and I think deserve.

NINETY YEARS A GARDENER

CAPTAIN W. S. C. PINWILL OF TREHANE

Rt. Rev. J. W. Hunkin, D.D., Bishop of Truro

THE traveller who looks out of the carriage window in a British Railways' train between Truro and Probus halt will see a little building which may arouse his curiosity. It is situated in a tiny wood on the North side of the line not far to the East of the bridge whereby

the railway crosses the lane which runs from Tresillian to St. Erme. It is a little pleasure-house, very ecclesiastical in appearance, with a window displaying family arms in stained glass, and an inscription: W.S. ob. 1861. This refers to the REVD. WILLIAM STACKHOUSE, sometime Vicar of Modbury in Devonshire, who succeeded to the family estate and came to live at Trehane. A window in the South Aisle of Probus Church was erected to his memory "by his sorrowing daughters" The eldest of these, Sarah, married the REVD. W. J. PINWILL, Vicar of Horley and Hornton, Oxfordshire, and their eldest son, WILLIAM STACKHOUSE CHURCH PINWILL, inherited Trehane on the death of his grandfather in 1861. He was then thirty years of age and was serving in the 27th Foot, the 1st Batt. Royal Inniskilling Fusiliers. In 1854, in the early days of the Crimean War, he was posted with his regiment to India and the East. Here he made a collection of butterflies which he subsequently presented to the Zoological Department of the British Museum. It was the most complete collection of butterflies received up to that date from Malacca and Penang. He sent also a large and rare collection of Indian birds to the South Kensington Museum in 1876.

On his retirement, with the rank of Captain, he settled at Trehane and devoted himself to gardening for the next 60 years. He was, indeed, a born gardener, and it is recorded that at the age of five he was highly incensed that the goose feathers which he had planted in a pot would not grow into geese.

When CAPTAIN PINWILL settled at Trehane THE HON. JOHN TOWNSHEND BOSCAWEN, brother of the sixth VISCOUNT FALMOUTH, had been Rector of Lamorran twelve years. He also was a very remarkable gardener, and the two men became great friends. They both worked incessantly in their gardens with their own hands. When the Rector was in his gardening clothes, as on week days he generally was, he would hide himself away if he heard a visitor announced. If the visitor, as it often was, was CAPTAIN PINWILL, MRS. BOSCAWEN would call him. "You can come out, TOWNSHEND," she would say, "its only CAPTAIN PINWILL."

JOHN CHARLES WILLIAMS of Caerhays was born in the year that PINWILL inherited Trehane (1861), and his cousin PERCIVAL DACRES WILLIAMS of Lanarth was born four years later (1865). Thus the succession of great Cornish gardeners runs:

THE HON. JOHN TOWNSHEND BOSCAWEN

CAPT. W. STACKHOUSE C. PINWILL

MR. JOHN CHARLES WILLIAMS AND MR. P. D. WILLIAMS

The garden at Trehane was not a very large one—about three acres. It consisted of light woodland along the entrance drive, with the garden proper on the South and East sides of the beautiful Queen Anne house. The kitchen garden was behind the house towards the stables. Shelter was provided by a belt of trees planted on the South West.

CAPTAIN PINWILL was a superb cultivator. If anyone could make a difficult plant "do," he could; and his garden was packed full of

interest, with many rarities and many best forms of more familiar species. He never had more than four men working under him, including the coachman; but every plant was given personal attention and there were no weeds.

The garden saw a great succession of visitors, particularly just before and after the Cornwall Spring Flower Show at Truro. None was more welcome than MR. P. D. WILLIAMS, and the following vivid descriptions, copied out from one of MR. WILLIAMS' notebooks, give a better idea of the garden than a laboured account would do.

SEPT. 5TH 1904.—As usual most interesting garden. *Crinodendron Hookeri* seeding. A very good variety of dark Statice in bloom. *Buddleia veitchiana* beautiful.

The beautiful variety of Bracken looking well. Capt. P. tells me it came up from some spores of mixed ferns sent from New Zealand years ago; it was the only plant that grew.

MAY 24TH, 1905—Wisteria very fine indeed. Several Rhododendrons in bloom that I did not know, Waterer hybrids. e.g. 'Old Port,' very dark but short of quality, Sappho good. *Fuchsia decorticata*, of which I have cuttings, is a hardy plant and grows almost to a tree, it should be hybridised. In its flower it is not much but its habit is very good.

Dodecatheons were good, and Trilliums quite wonderful, the latter over.

He gave me a piece of a nice bright bugle, a very nice habited London Pride (very dwarf) and a nice white daisy.

Habranthus not yet in bloom, but very strong, as also *Orchis Foliosa*.

Hyacinthus amethystinus had seeded itself everywhere and was very beautiful.

MAY 26TH, 1909—The bid climbing hydrangea on the West wall was in fine form and is a truly magnificent plant.

A variety of *Buddleia Colvillei* which Capt. P. struck from cuttings I had from St. Anne's was full of flower buds, much more so than the usual variety. We have a plant of this on the Lodge.

There was a nice dwarf green variety of flax.

A good cherry red Rho. of the Waterer type. Pink Pearl in full sun looking fairly well. Columbin 'Turk's Cap' in good form and a nice thing.

Trilliums very good and the Erythroniums must have been unusually so.

Rodgersia pinnata a later grower than the others and a deeper bronze leaf.

A fine crimson buglos, different from any I know.

Meconopsis integrifolia in good form.

Crinodendron Hookeri, the best plant I've seen.

Fremontia californica in flower and looking well.

Vancouveria hexophylla, an Epimedium-looking plant, was very nice and some promised to me; also a big and striking ornithogalum viz. *Scilla ciliaris*.

AUGUST 1909—We went here too together and of course the place was brimful of interesting plants.

There is a *Dyckia* with an interesting history: a friend of CAPT. PINWILL, I believe CAPT. JULYAN, found it as a most minute seedling hardly bigger than a pin's head in the axil of the leaf of an imported

orchid probably from Brazil. It is now a fine plant with many crowns, and BOWLES told us that they have only one plant at Kew and that it was considered to be the only known specimen.

MR. WILLIAM'S visits followed a regular procedure. He would drive over in the morning and go round the garden with CAPTAIN PINWILL. There would be roast duck for luncheon, followed by a long afternoon in the garden and a late cream tea. Strawberry teas were given with the tennis parties, tennis beginning generally about 1st May. Various sorts of strawberries were grown, including a large dark one. When they first were getting ripe CAPTAIN PINWILL, who used regularly to go out into the garden about 7 a.m., would bring some in for breakfast!—first a small plate; then as the fruit grew more plentiful a larger, and a larger still: finally a plate for everybody, including one left at the door for the postman. The fruit at Trehane was finer than anywhere else. There was an enormous 'Royal George' Peach which occupied 800 square feet; and MR. FRED TAMBLYN, the head gardener, was particularly good with fruit. He was at Trehane for 30 years, and he was "wonderful with names." The 'Royal George' was followed by a later peach 'Sea Eagle,' The nectarines were marvellous, too, especially 'Humboldt.' Apricots, on the other hand, would never do at Trehane; but there were pears and plums and figs and morello cherries and other fruits of the finest quality, and choice vegetables galore.

A sister of the Captain's had married the Headmaster of Probus school, who afterwards became Archdeacon of Bombay, and she and her husband, ARCHDEACON STEAD, travelled a great deal in Europe after his retirement from Bombay. They sent home to CAPT. PINWILL interesting plants from Greece, Italy, Switzerland and the Pyrenees. The Captain used also to buy a considerable number of plants. He chose them with great care, and a prominent Irish nurseryman once said that he had never known CAPT. PINWILL to buy a bad plant.

When a consignment of plants arrived he would be kept busy for days. He would get so absorbed in his work that at meal times to summon him a bell would be rung out of every window of the house. He would go out at night, in spite of colds, to put lime round his favourite plants to protect them from slugs. In the summer he would spend hours in watering. He had an immense bonfire once a year, which burned for a month, and it was considered a terrible crime if a flame was allowed to issue from it. He had vast compost heaps, and made a great deal of use of granite gravel and rookery leaf-mould.

Among the most notable plants in the garden were *Acacia melanoxylon*, *Calceolaria violacea*, *Callistemon speciosus*, *Eupatorium purpureum*, a very fine specimen of *Genista aetnensis*, *Hedychium Gardnerianum*, *Holboellia latifolia*, *Hymenanthera crassifolia* outside the porch, a peppermint-scented variety of *Lippia citriodora*, *Mitraria coccinea*, *Plagianthus betulinus*, *Prostanthera rotundifolia* and *violacea*, *Puya chilensis*, *Sophora tetraptera*, *Telopea truncata* and *Trachelospermum jasminoides*. Among the Camellias were *reticulata* and 'Lady Clare,' and there were a number of Rhododendrons, including *Falconeri*, *sinogrande* and *Thomsoni*, as well as the Waterer hybrids mentioned by MR. P. D. WILLIAMS. There were also several species of *Magnolia*

(*grandiflora*, *Lennei*, *obovata*, *parviflora*, *sinensis*, *Soulangeana*, *stellata*, *Watsonii*). The famous *Magnolia Campbellii* is still flourishing. It was 45 feet high in 1936, when it produced some 1500 blooms. It is a grafted plant, and very singular it looks, its own bole swelling out wider all round than its stock. The still more famous *Philesia buxifolia*, which was taken away after CAPT. PINWILL's death, was said to be the second largest in England (5 feet \times 3 feet). It took four strong men to carry it when lifted.

On February 9, 1915 CAPT. PINWILL was awarded the V.M.H., and the letter which accompanied the medal spoke of his great generosity and the help which he had given to many people in starting their gardens. "No plant was too rare or too small to be shared by a fellow-gardener."* "His type of gardening, his skill, and his great generosity," as a correspondent wrote to *The Times* on June 22, 1926, "were only equalled by the late CANON ELLACOMBE of Bitton."

On the last day of September 1949, through the kindness of the present owners, MR. and MRS. A. C. DEAKIN, I was able to walk through the garden with MISS E. M. PINWILL, who, trained as a nurse, came home to look after her parents in their declining years. Her father handed the garden over to her in 1919, though he retained his own keen interest and was found climbing a ladder, four years later, at the age of 92.

During the recent war Trehane was occupied by the military, and the garden was sadly neglected. Then, three years ago, when MR. and MRS. DEAKIN were taking the place over, there occurred a most unfortunate fire, and the fine house was gutted. It has not, as yet at all events, proved possible to re-condition the garden, but a number of the old plants are flourishing still. The great *Magnolia Campbellii* has already been mentioned, and several of the other species are still growing well; two or three *Davidias* are now very large; there are several *Chamaecyparises*, one like a lofty mast with a mop of leaves on the top of it. The tall yew hedge along the drive where the cobwebs used to glisten on a sunny autumn morning is still there; the *Wisteria* is still flourishing. In the main garden on the East of the house we saw an enormous *Azara microphylla*, a Myrtle still in flower, an immense variegated box, the *Pieris japonica* mentioned above, very large and straggling, great *Rhododendrons*, including a pink which came from MR. SHILSON; the conifer where a golden-crested wren used to make its nest; the place where the famous bed of the Madeira Orchis, *Orchis foliosa* (Fig. 170), used to be—the finest in England—and another near by where the *Galax aphylla* grew that afterwards went to MR. JOHN CHARLES WILLIAMS. It was for these smaller plants rather than trees and shrubs that the garden was most noted. *Eremurus*, *Erythroniums*, *Trilliums*, and the *Hellebore* with spots, which came from MR. TYERMAN of Tregony, another great friend of CAPTAIN PINWILL's and a great gardener, whose name is perpetuated by the fine *Rhododendron* which he raised (*Nuttallii* \times *formosum*), awarded F.C.C. in 1925. CAPTAIN PINWILL himself raised a fine *Muscari*, *M. Pinwilli*, with large sky-blue flowers.

We passed through what used to be the poultry yard, the former home of the *Trilliums* and *Erythroniums*, and in an enclosure beyond

* P. D. Williams, *Gardeners Chronicle*, 12 June, 1926.

we saw the enormous fat trunk of a big *Phoenix canariensis*. On the North side of the house the old evergreen, *Lardizabala bitermata*, still bears its small chocolate flowers. A climbing rose in front of the porch had flowered gaily after the scorching fire, but had recently died. Many other plants there were, Azaleas, Camellias, Cotoneasters, Leycesteria, and Pittosporums, which need no special mention. MISS PINWILL remembers the carpets of pink and white autumn Cyclamen under the big Fir trees (now cut down), and the sheets of Squills and white and blue Chionodoxas and *Erinus alpinus* running over the paths and up the granite steps in the East Garden.

We lingered to admire the wide view of meadow and woodland, hill and dale, to the fine tower of Probus Church a little North of East, three miles away, under the shadow of which the mortal remains of the good Captain lie buried. On the first day of January a hundred and nineteen years ago he was born (1831), and he died on Sunday, May 30, 1926. No gardener could expect a longer or better innings.

My sincere thanks are due to MISS E. M. PINWILL and to LIEUT.-COLONEL W. R. PINWILL, without whose very kind help the above account could not have been written.

WISLEY TRIALS 1948-1950

NARCISSUS AT WISLEY 1948-1950

One hundred and eighteen varieties were planted in the autumn of 1947 on the western side of Battleston Hill, and in addition seven were planted in the autumn of 1948. Of these, twenty-two had been selected for trial as varieties suitable for garden decoration by the Narcissus and Tulip Committee; the remainder were grown for comparison and judgment. Most of these had received awards for garden decoration in previous years.

Twenty-five single-nosed bulbs of each variety were given the warm water treatment, 110° F. for three hours, before planting to ensure that neither eel-worms nor the larvae of the Narcissus flies should mar their growth. The trial beds were dusted with a 5 per cent. D.D.T. dust during mid May against the large Narcissus fly, *Merodon equestris*.

The trial was inspected several times during the spring of 1949 and 1950 by the Narcissus and Tulip Committee and their recommendations for awards were made in 1949 and 1950, those for 1949 are described in R.H.S. JOURNAL 74, pp. 465-468. The present report indicates the Committee's recommendations, also the present state of the trials, varieties retained and varieties deleted from the trials.

In addition, the following varieties are being grown at Wisley for trial, these were planted in the autumn of 1949: ATATURK (Stern), ALIGHT (P. D. Williams), CARGAN (G. L. Wilson), DAMSON (P. D. Williams), GOLDEN HARVEST (Warnaar), KINGSTON (Stern), MOUNT HOOD (van Duersen), PATCHING (Stern), PENBERTH (Favell), WEE BEE (Zandbergen).

TRUMPET VARIETIES

Division 1.A

His Excellency (raised and introduced by Mr. Guy L. Wilson and sent by Mr. Wm. J. Dunlop, Dunrobin, Ballymena, N. Ireland). H.C. March 31, 1950.—Plant vigorous with erect foliage 18 inches tall; flower stems upright, 21 inches long. Flowers 4½ inches diameter; perianth segments 2 inches long, flat, overlapping for half their length. Lemon Yellow (H.C.C. 4/1); trumpet

2 inches long, Lemon Yellow (H.C.C. 4). Flowers 24 in the first year, 59 in the third.

The following varieties have been retained for future judgment and comparison: MUSKETEER, A.M. 1941; GOLDEN RAY, A.M. 1947; SOLFERINO, A.M. 1936; WRESTLER, A.M. 1936; DECENCY, F.C.C. 1944; SULPHUR PRINCE, A.M. 1939; CHARLES I, A.M. 1939; DANDY BOY, A.M. 1947; BRANDON, A.M. 1936; YELLOW BEAUTY, H.C. 1936; KANDAHAR, A.M. 1947; GARRON, A.M. 1946; GODOLPHIN, A.M. 1949; CROMARTY, A.M. 1949.

The following variety has been deleted from the trial: PRINCIPAL.

Division 1B

The following varieties have been retained for future judgment and comparison: BOSWIN, A.M. 1946; GLENRAVEL, H.C. 1946; FINGAL, A.M. 1946; CHATSWORTH, A.M. 1949.

The following variety has been deleted from the trial: MRS. E. C. MUDGE, A.M. 1936.

Division 1C

The following varieties have been retained for future judgment and comparison: MRS. ERNST H. KRELAGE, A.M. 1944; ROXANE, A.M. 1936; SCAPA, A.M. 1949; LIEUT. H. HODGES, H.C. 1949.

The following variety has been deleted from the trial: PACIFIC, A.M. 1946.

LARGE CUPPED VARIETIES

Division 2A

The following varieties have been retained for future judgment and comparison: HELIOS, A.M. 1936; YELLOW POPPY, A.M. 1947; GARIBALDI, A.M. 1936; JUBILANT, F.C.C. 1944; HAVELOCK, F.C.C. 1936; ST. IVES, A.M. 1939; NIMROD SYN. CARLTON, F.C.C. 1939; RED DEFIANCE, A.M. 1936; COVERACK GLORY, H.C. 1936; KILLIGREW, A.M. 1936; FORTUNE, A.M. 1947; CROCUS, A.M. 1947; CARBINEER, A.M. 1940; RUSTOM PASHA, A.M. 1949; GORING, A.M. 1949; MARION CRAN, A.M. 1936; MARKSMAN, A.M. 1947; ROSELENE, H.C. 1949; ROUGE; BRIDGET HILL; TREVISKY; OLYMPIC TORCH.

The following varieties have been deleted from the trial: AMBULE, A.M. 1936; PEPPER, C. 1939; CHEERIO; ORANGE BIRD, A.M. 1947; SUNPROOF ORANGE; BOKHARA; WHITELEY GEM; LUCCOMBE.

Division 2B

Nissa (raised by the late Brodie of Brodie and sent by Messrs. Barr & Sons, 11-13 King Street, Covent Garden, London, W.C.2). A.M. March 31, 1950.—Plant vigorous with erect foliage, 15 inches tall; flower stems upright, 18 inches long. Flowers $3\frac{1}{2}$ inches diameter; perianth segments $1\frac{1}{2}$ inches long, flat, overlapping for two-thirds of their length, creamy-white; cup $1\frac{3}{8}$ inch deep, expanded, Canary Yellow (H.C.C. 2). Flowers 24 in their first year, 109 in the third.

Polindra (raised by the late P. D. Williams and sent by Messrs. Barr & Sons, 11-13 King Street, Covent Garden, London, W.C.2). A.M. April 14, 1950.—Plant vigorous with erect foliage 15 inches high; flower stems strong, upright, 18 inches long. Flowers 4 inches diameter; perianth segments $1\frac{1}{2}$ inch long, flat, overlapping for half their length, creamy-white; cup 1 inch deep expanded, Mimosa Yellow (H.C.C. between 602 and 602/1). Flowers 23 in the first year, 71 in the third.

Farewell (raised and sent by M. P. Williams, Esq., Lanarth, St. Keverne, Cornwall). H.C. April 14, 1950.—Plant vigorous with erect foliage 15 inches tall; flower stems upright 20 inches long. Flowers 5 inches diameter; perianth segments $2\frac{1}{4}$ inches long, flat, overlapping for half their length, creamy-white; cup $1\frac{1}{8}$ inch deep, expanded, a shade between Sulphur Yellow (H.C.C. 1/1) and Canary Yellow (H.C.C. 2/1). Flowers 26 in the first year, 52 in the second.

The following varieties have been retained for future judgment and comparison: EVA, **A.M.** 1936; WARLOCK, **F.C.C.** 1939; FOLLY, **F.C.C.** 1936; LESLIE HULBERT, **A.M.** 1946; ZEELAND, **A.M.** 1947; ORANGE CRINOLINE; BODILLY, **F.C.C.** 1949; FLAMENCO, **A.M.** 1949; SEA SHELL, **A.M.** 1944; GRAYLING, **A.M.** 1936; TUNIS, **F.C.C.** 1936; SNOW QUEEN, **F.C.C.** 1947; DENYS MEYER, **A.M.** 1947; BRUNSWICK, **A.M.** 1947; AGNES MONTEFIORE, **A.M.** 1947.

The following varieties have been deleted from the trial: FAVELL LEE, **H.C.** 1947; MILKMAID, **H.C.** 1936; REWA, **A.M.** 1946.

Division 2C

The following varieties have been retained for future judgment and comparison: CICELY, **A.M.** 1936; MARMORA, **F.C.C.** 1936; HERA, **A.M.** 1936; SILVER BUGLE, **A.M.** 1949; NIPHETOS.

The following variety has been deleted from the trial: LADY BETTY.

SMALL-CUPPED VARIETIES

Division 3A

Market Merry (raised by the late Brodie of Brodie, introduced by Mr. Guy L. Wilson and sent by Commander A. M. Williams, R.N.). **F.C.C.** April 14, 1950.—Described R.H.S. JOURNAL 74, p. 467 (**A.M.** 1949). Flowers 37 in the first year, 100 in the third.

The following varieties have been retained for future judgment and comparison: ANGMERING; DINKIE, **A.M.** 1936; GULLIVER, **A.M.** 1947; JOHN PEEL.

The following varieties have been deleted from the trial: NANNY NUNN, **H.C.** 1936; TREDORE.

Division 3B

The following varieties have been retained for future judgment and comparison: ARCADIA; MING, **H.C.** 1936; PRINCE, **A.M.** 1944; TURIN; SUNSTAR.

The following variety has been deleted from the trial: SANDRINGHAM, **H.C.** 1947.

Division 3C

The following variety has been deleted from the trial: SILVER CIRCLE.

DOUBLE VARIETIES

Division 4

The following varieties have been retained for comparison: BUTTERMILK, **H.C.** 1936; MARY COPELAND, **A.M.** 1936; FEU DE JOIE, **A.M.** 1944; MRS. WILLIAM COPELAND, **A.M.** 1944.

The following variety has been deleted from the trial: CHEERFULNESS, **F.C.C.** 1939.

TRIANDRUS VARIETIES

Division 5A

The following varieties have been retained for future judgment and comparison: NIVETH, **H.C.** 1936; RIPPLING WATERS, **F.C.C.** 1947.

The following varieties have been deleted from the trial: HAPPY EASTER; UCLULUET GEM.

CYCLAMINEUS VARIETIES

Division 6A

The following variety has been retained for comparison: BARTLEY, **F.C.C.** 1949.

The following variety has been deleted from the trial: ORANGE GLORY, **A.M.** 1936.

Division 6B

The following variety has been retained for comparison: BERYL, **A.M.** 1936.

The following variety has been deleted from the trial: FAIRY WINGS, **C.** 1941.

YONQUILLA VARIETIES

Division 7A

The following varieties have been retained for comparison: AURELIA, **A.M.** 1936; GOLDEN SCEPTRE, **F.C.C.** 1936.

Division 7B

The following varieties have been retained for comparison: **GOLDEN PERFECTION**, A.M. 1944; **LANARTH**, F.C.C. 1936; **HESLA**, A.M. 1936; **TREVITHIAN**, F.C.C. 1936; **YELLOW PRIZE**, A.M. 1936.

TAZETTA VARIETIES*Division 8*

The following varieties have been retained for future judgment and comparison: **BETHA**; **GLORIOUS**, A.M. 1936; **SCARLET GEM**, F.C.C. 1936; **WHITE'S HYBRID**, A.M. 1939.

POETICUS VARIETIES*Division 9*

Actaea (raised and introduced by Messrs. G. Lubbe & Son and sent by Messrs. R. H. Bath, Ltd., The Floral Farms, Wisbech, Cambs.). A.M. April 14, 1950.—Described R.H.S. JOURNAL 73, p. 84 (H.C. 1947). Flowers 26 in the first year, 90 in the third.

The following varieties have been retained for comparison: **FAIR LADY**, A.M. 1931; **SARCHEDON**, A.M. 1944; **YPSILANTE**, A.M. 1949.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1950

TREES & SHRUBS

Acer palmatum, **Coral-bark Maple** A.M. February 14, 1950. This attractive Maple was shown under the name 'Senkaki,' but what appears to be an identical plant is also to be found in nurseries labelled 'Sangokaku,' and we venture, therefore, to give it an English description. The value of the variety lies in the rich coral-red colouring of the stems and twigs, which are extremely bright when illuminated by winter sunshine. Exhibited by the Sunningdale Nurseries, Windlesham, Surrey.

Camellia japonica '**Pink Pearl**' A.M. May 5, 1950. The flowers of this pretty double Camellia are two inches across, rather flat with perfectly imbricated petals. Their colour is Neyron Rose (H.C.C. 623/3) with a faint white stripe down the centre of each petal and are borne freely among the pale green ornamental foliage. Exhibited by Capt. Collingwood Ingram, Benenden, Kent.

Camellia reticulata '**Trewithen Pink**' A.M. April 4, 1950. This very fine form was raised from seed collected by Forrest in China. The semi-double flowers are 4 inches wide, coloured Rose Bengal (H.C.C. 25/3), offset by the dull leathery green leaves. These are 4 inches in length, elliptic, long acuminate and sharply toothed. Exhibited by G. H. Johnstone, Esq., O.B.E., Trewithen, Cornwall.

Clivia kewensis '**Bodnant Yellow**' A.M. April 4, 1950. This very beautiful plant for the cool greenhouse has a dense umbel of about 20 flowers, each flower being narrowly funnel-shaped, 3 inches long and 3 inches wide with somewhat recurved petals which are free almost to the base. Their colour is Straw Yellow (H.C.C. 604/3), while the centre of the petals and the tube are shaded Amber Yellow (H.C.C. 505). Exhibited by Lord Aberconway, C.B.E., LL.D., V.M.H., Bodnant, N. Wales.

Hippeastrum rutilum var. **fulgidum** A.M. March 7, 1950. A very striking Brazilian bulbous plant valuable for winter flowering in the warm greenhouse. The stout scapes, two feet high, arise among pale

green leaves of similar height, and each bears four widely expanded flowers about four inches across. The petals are ovate, undulate, tapering at the tips, *Nasturtium Red* (H.C.C. 14/1), paling to greenish-yellow at the base. Exhibited by The Director, R.H.S. Gardens, Wisley.

***Ixia paniculata* A.M.** May 5, 1950. This plant makes an attractive subject for the cool greenhouse. The graceful flower spikes carry about twelve blooms of Lemon Yellow (H.C.C. 4/3), the centre of the flower, the tube and the reverse of the petals being delicately shaded Mandarin Red (17/2). The flowers are up to two inches across, the tube being slightly longer, and the leaves are $\frac{1}{2}$ inch wide and somewhat glaucous. Exhibited by Mr. A. V. Pike, Hever Castle Gardens, Edenbridge.

***Prunus glandulosa albiplena* A.M.** May 5, 1950. This charming Almond forms a low bush, the young whip-like branches being set with pure white double flowers in short-peduncled clusters of two flowers. Each flower is made up of about 10 small entire petals with one leafy carpel. The leaves which appear with the flowers are oblanceolate and crenate-serrate. Exhibited by W. Bentley, Esq., Quarry Wood, Burghclere, Newbury.

***Prunus Persica 'Aurora'* A.M.** April 4, 1950. The flowers of this ornamental peach are carried in dense sessile clusters on completely leafless branches. They are over an inch wide, double, with slightly frilled petals of Fuchsine Pink (H.C.C. 627/3). Exhibited by Messrs. G. Jackman & Son (Woking Nurseries) Ltd., Woking, Surrey.

***Prunus Persica 'Iceberg'* A.M.** April 4, 1950. This ornamental flowering peach, raised by Messrs. W. B. Clarke & Co. of San José, California, is a vigorous grower and of good constitution. The pure white semi-double flowers are $1\frac{1}{4}$ inch wide, carried in dense shortly-stalked clusters on leafless branches. Exhibited by Messrs. G. Jackman & Son (Woking Nurseries) Ltd., Woking, Surrey.

***Prunus serrulata 'Okiku'* A.M.** May 5, 1950. A lovely variety of Japanese Cherry carrying clusters of 3-4 double flowers coloured Solferino Purple (H.C.C. 26/3) on the backs of the petals but fading almost white in the centre of the flower. They are two inches across, on pedicels $1\frac{1}{4}$ inch long and peduncles of $\frac{1}{2}$ inch. Each is made up of 25 petals, the outer fringed and the inner emarginate, and has a perfect ovary. The leaves are pale bronze when folded but soon change to green. Exhibited by Capt. Collingwood Ingram, Benenden, Kent.

***Prunus spinosa plena* A.M.** April 4, 1950. This charming double variety of the common Blackthorn bears creamy-white double flowers each $\frac{1}{2}$ inch wide, made up of a large number of narrow frilled petals. They are carried in numerous short-stalked, two-flowered clusters on bare black branches. Exhibited by Capt. Collingwood Ingram, Benenden, Kent.

***Salvia gesneraeflora* A.M.** March 7, 1950. A very vigorous shrubby species suitable for the cool greenhouse, where its somewhat lax growths reach a height of eight or ten feet. The young shoots bear ovate-cordate, light green leaves four to five inches long, and terminal inflorescences made up of four superposed, 6-flowered clusters. The scarlet flower is broadly tubular, two inches long, with a recurved lower lip. Exhibited by P. M. Syngé, Esq., Clare Cottage, West Byfleet.

BOOK NOTES

“Plant Hunting in Europe.” By Dr. Hugh Roger-Smith. Demy 8vo. Ill. (Alpine Garden Soc.) 5s.

No better guide could be found to the floras of the Alps and the Pyrenees than Dr. Roger-Smith, and all keen rock gardeners as well as climbers and lovers of the mountains will welcome his little book, only wishing that there were more of it. One day we hope that Dr. Roger-Smith will give us a *magnum opus* on this subject based on his many visits. The chapters range the mountains from Switzerland to the Pyrenees and thence to Yugoslavia and Czechoslovakia.

The introduction gives precise instructions on the cleaning and packing of collected plants, based on long experience. One should patiently wash off all the earth and wrap in bundles of very slightly damp moss.

Each chapter recalls familiar haunts of delight or stimulates one to venture into new centres. This is a book I shall certainly take with me on my next mountain holiday and I can strongly recommend it to all visiting the mountains either for the first or the fiftieth time. Their holiday, as well as possibly their gardens, will be the richer for having read it.

P. M. SYNGE

“Chrysanthemums for Amateur and Market Grower.” By F. W. Allerton. 177 pp. Illus. (Faber & Faber, Ltd.) 15s. net.

This book on Chrysanthemums has been carefully written and the subject treated in very comprehensive fashion not only from the severely practical but also from the scientific standpoint—an interesting achievement. All growers of the Chrysanthemum, both amateur and professional, cannot fail to find a deal of valuable information in its pages.

Instructive details relating to the culture of the Chrysanthemum in all its varied forms and from all aspects are given without stint. It is essentially a book that is up to date. The understanding amateur with a scientific turn of mind no less than the commercial grower will appreciate the why and wherefore of the cultural instructions.

After an interesting introduction, in which reference is made to modern trends in the culture of Chrysanthemums generally, the reader is taken chapter by chapter through the whole gamut of all that pertains to the subject. The first four chapters are devoted to the important matter of propagation, followed by others on such subjects as composts, nutrition, watering, light, pests and diseases, soil preparation, early and mid-season and late varieties, picking and marketing, exhibiting and so on.

There are numerous illustrations both from line drawings and from photographs. The latter deserve to be much better reproduced. There are also four coloured illustrations.

The index does not contain any direct reference to manures or manuring, but under “feeding” and “fertilizers” the reader is referred to appropriate pages. Although organic manures are mentioned and the need for humus content is emphasized in the chapter on soil preparation, the reader is advised that the only satisfactory way of feeding Chrysanthemums of all types is by the use of liquid fertilizers. It is doubtful whether all growers will be convinced.

Throughout the book the author is at pains not only to give lucid cultural instructions but also to indicate the reasons why certain details of culture are recommended.

The student gardener and all those who are thinking of taking up Chrysanthemum growing commercially will do well to include this book in their reading.

HOWARD H. CRANE

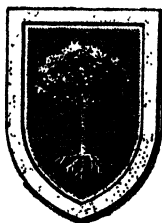
Bulletin No. 1 of the New Zealand Iris Society (March 1950). (Secretary: Mr. D’Arcy Blackburn, 14 Clifford Street, Gisborne, N.Z.)

Iris lovers in this country will surely join with us in offering a sincere welcome to this first modest bulletin of the newly formed New Zealand Iris Society. In addition to interesting notes by New Zealand growers, it contains a valuable article by Major A. Pam, V.M.H., based on personal recollections of Iris collecting in the Mediterranean and North Africa and a useful critical article dealing with the newer tall bearded Irises by Mr. N. Leslie Cave, the treasurer of our Iris Society. We look forward to seeing future issues of this bulletin.

P. M. SYNGE

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXXV



Part 9

September 1950

THE SECRETARY'S PAGE ANNOUNCEMENTS—SEPTEMBER AND OCTOBER

Shows .

TUESDAY, September 12 12 NOON to 7 P.M.	Fortnightly Show. <i>Cactus and Succulent Society's</i>
WEDNESDAY, September 13 10 A.M. to 5 P.M.	<i>Competition.</i> <i>Alpine Garden Society's Competition.</i>
FRIDAY, September 15 12 NOON to 7 P.M.	<i>National Rose Society's Show.</i>
TUESDAY, September 19 12 NOON to 7.30 P.M.	<i>National Dahlia Society's Show.</i>
WEDNESDAY, September 20 10 A.M. to 5 P.M.	
TUESDAY, September 26 12 NOON to 7 P.M.	Fortnightly Show.
WEDNESDAY, September 27 10 A.M. to 5 P.M.	<i>Royal Air Force Horticultural Show.</i>
TUESDAY, October 10 12.30 P.M. to 7 P.M.	Fortnightly Show.
WEDNESDAY, October 11 10 A.M. to 5 P.M.	Autumn Fruit and Vegetable Show.
TUESDAY, October 24 12 NOON to 6 P.M.	Fortnightly Show.
WEDNESDAY, October 25 10 A.M. to 5 P.M.	Tree and Shrub Competition. Floral Arrangement Competition for Professionals.

Kindred Society's Show

TUESDAY, September 19 1 P.M. to 7.30 P.M.	<i>National Chrysanthemum Society's Show.</i>
WEDNESDAY, September 20 10 A.M. to 5 P.M.	R.H.S. tickets will not admit.

Lectures

- TUESDAY, September 12 at 3 P.M. "Early Flowering Chrysanthemums"
by MR. JOHN B. STEVENSON.
- TUESDAY, September 26 at 3 P.M. "New Varieties of Dahlias and their
Cultivation" by MR. STUART OGG.

Lectures—continued

TUESDAY, October 10 at 3 P.M. "Outdoor Peach Growing" by MR. JUSTIN BROOKE.

TUESDAY, October 24 at 3 P.M. "Horticulture as a Career" by MR. F. A. SECRETT, C.B.E., F.L.S., V.M.H., and MR. J. L. RUSSELL.

Kindred Society's Lecture—The Alpine Garden Society has arranged a lecture on Wednesday, September 13 at 2.30 P.M. in the R.H.S. Lecture Room by MR. B. O. MULLIGAN, Director of the University of Washington Arboretum, on "Alpine Plants of the Cascade and Olympic Mountains." All Fellows are invited to this lecture, which will be illustrated with colour films.

Demonstrations at Wisley—The following demonstrations will be given at Wisley, that on the second day being in each case a repetition of the demonstration given on the first:—

Vegetable Garden

September 13, 14. Harvesting and Storing. (2–4 P.M.)

Flower and Vegetable Garden

October 4, 5. Digging, Trenching, Manuring, and Composting. (2–4 P.M.)

National Trust Gardens—We have been asked by the National Trust to bring to the notice of our Fellows the fact that the under-mentioned gardens are open to the public on the times and dates given. It is understood that all these gardens are worthy of a visit.

Bateman's, Burwash, Sussex—Wednesdays, Saturdays and Sundays throughout the year. May to September: 2–5 P.M.; October to April: 2–4 P.M. Open on Easter and Whit Mondays and August Bank Holiday from 11 till 5 P.M.

Barrington Court, near Ilminster, Somerset—Wednesdays throughout the year, 10.15 A.M. to 12.15 P.M. and 2 P.M. to 5 P.M.

Blickling Hall, near Aylsham, Norfolk—Thursdays and Sundays from 2 to 5 P.M. between May and September inclusive. Special 'bus service from Bell Avenue, Norwich, at 2.30 P.M.; returns 5.45 P.M.

Cliveden, near Maidenhead, Bucks.—Thursdays from 11 to 6.30 P.M. between April 1 and October 31. Entrance by Hedsor Lodge at N. end.

The Court, Holt, near Trowbridge, Wiltshire—Wednesdays from 2.30 to 5.30 P.M. between March 15 and October 15.

Gunby Hall, Burgh-le-Marsh, Lincolnshire—Tuesdays and Thursdays from 2.30 to 7.30 P.M. between April 1 and September 30.

Montacute House, near Yeovil, Somerset—Daily, including Sundays (except Tuesdays, Christmas Day and Good Friday); April to September: 11 A.M. to 6 P.M.; October to March: 11 A.M. to 4 P.M.

Packwood House, near Hockley Heath, Warwickshire—Summer: Wednesday, Saturdays and Bank Holidays: 2 to 7 P.M. Sundays 2 to 5 P.M. Winter: Wednesdays, Saturdays, Sundays and Bank Holidays: 2 to 5 P.M. Closed Christmas Day.

Polesden Lacey, near Dorking, Surrey—Daily, including Sundays, throughout the year.

Upton House, near Banbury, Warwickshire—Wednesdays and Saturdays from July 1 to September 30: 2 to 6 P.M. Other months, Wednesdays only, 2 to 6 P.M.

WISLEY IN SEPTEMBER

As the season advances flowers give way to brilliant foliage and fruits and as the days shorten the greenhouses once more attract visitors' attention. The Half-Hardy House is bright with colour partly afforded by the scarlet 'Scarborough Lily,' *Vallota purpurea*, and the strange flowers of *Fascicularia bicolor* which are borne in dense sea-green papery clusters surrounded by spiny linear leaves stained scarlet at the base. *Diplacus glutinosus*, in both buff and crimson forms, the light orange-flowered sprays of *Sphaeralcea Fendleri* and the purplish-rose *Oxalis Bowei* have all been blooming profusely for several months. \times *Amarcrinum Howardii* is a striking plant forming tall scapes which bear numerous soft pink funnel-shaped flowers. It is a bi-generic hybrid between *Amaryllis Belladonna* and *Crinum Moorei*. Trained along the roof supports are *Solanum jasminoides*, *Calceolaria Pavonii*, and *Mandevilla suaveolens*. The latter is still flowering and also bears numerous twin, horn-like pods. Trained up at the far end of the house are two varieties of Abutilon and *Plumbago capensis*, the azure-blue flowers of which cover walls and houses in South Africa. There is also much to interest visitors in the Temperate House. In the centre bed the orange flowers of *Cestrum aurantiacum* are making a fine display, likewise the evergreen *Brunfelsia undulata* with corymbs of creamy flowers, and *Correa alba*. *Nerium Oleander*, seen so frequently in southern Europe, is also flowering. The side staging is gay with a variety of plants such as *Begonia* 'Gustav Hind,' a double-flowered form of *B. semperflorens*, and purple and yellow forms of *Lantana Camara*, while the varieties of *Gloxinia*, *Streptocarpus*, *Achimenes* and *Hibiscus rosa-sinensis* do much to add to the colourful display.

In the Stove House are many ornamental foliage plants while more and more flowers are appearing among the Orchid collection.

At the foot of the rock wall opposite the greenhouses are bays planted with the dazzling blue-flowered *Gentiana sino-ornata*, while further along on the frameyard wall is an attractive cream-flowered Clematis with a fresh cowslip-scent, *C. Rehderiana*. From here the Terrace Walk may be reached by way of the Lavender Walk and the formal bedding display viewed against a background of green lawns and Hornbeam hedges.

In the Floral Trial Grounds are collections of Michaelmas Daisies, Early Flowering Chrysanthemums, Korean Chrysanthemums, Annual Asters and Dahlias.

On Weather Hill both the Rose Borders and the Annual Border will continue to be colourful as long as the weather remains favourable.

The number of plants in flower in the Alpine House at this season is necessarily more limited, but nevertheless there are interesting species to be seen, such as *Anemone glaucifolia* with purple, Poppy-like flowers, the strange cerise flower heads of *Trichinium Manglesii*, the large-flowered *Campanula isophylla Mayi*, and sky-blue *Lobelia Preslii*. These are supplemented by Sedums, Sempervivums and other decorative foliage plants. Outside the house the *Gazanias* continue to open whenever the sun shines and will do so until frost ends their brilliant display.

Kniphofia Galpinii, a small and very brilliant Red-hot Poker, a large bush of *Hibiscus syriacus* in its white variety *totus albus*, the scarlet *Zauschneria californica*, forms of *Fuchsia magellanica*, and clumps of *Ceratostigma plumbaginoides* provide the brightest picture on the Rock Garden during this month, although there are many other smaller patches of colour to catch the eye. These are formed by *Calendula suffruticosa*, *Schizostylis coccinea*, the rosy-pink flowers of *Polygonum affine*, the cool-looking powder-blue *Convolvulus mauritanicus* and *Liriope Muscari*, a plant reminiscent of the Grape-hyacinth. *Verbena chamaedryfolia* will continue flowering until the frosts but is somewhat tender and needs some protection during the winter.

At the top of the Alpine Meadow and in the Wild Garden the charming flowers of *Cyclamen neapolitanum* are again appearing in great quantity. Similarly another plant associated with the advent of autumn is the Willow Gentian, *Gentiana asclepiadea*, filling moist corners with arching blue racemes. The flowering period of this part of the Gardens is nearly over but this makes decorative fruits more noticeable, especially the great seed heads of *Lilium giganteum* and the pendent cucumber-like Magnolia fruits.

In contrast the Heather Garden is at its brightest, notable among the numerous heaths planted here are *Erica vagans* 'Pyrenees Pink,' *E. v. grandiflora*, *E. cinerea* 'Cevennes' and *Calluna vulgaris* 'H. E. Beale.' An extensive planting of *Daboecia cantabrica* forms an intense purple carpet. Elsewhere in Seven Acres shrubs such as Barberries, Euonymus, Crab Apples, Cotoneasters and Sea Buckthorn are clothed in brightly coloured fruits of considerable decorative value at this season. Bordering the Pinetum and elsewhere in Seven Acres, Colchicums in many shades of rosy-purple are conspicuous, and they are planted in greatest quantity in the Azalea Garden where they carpet the ground beneath Viburnums hung with shining scarlet, yellow or black berries.

Despite the late season the Herbaceous Borders are well worth a visit, the display being lengthened by such plants as *Aster acris*, *Chrysanthemum rubellum* and bluish-pink flowered *Sedum spectabile*. There are two very good Salvias, *S. caerulea* and *S. uliginosa*; the latter grows to a height of 6 feet with dense clusters of sky-blue flowers making it an extremely valuable border plant. Splashes of glowing crimson are afforded by *Lobelia fulgens* and *L. cardinalis*.

In the Award of Garden Merit Collection most of the herbaceous plants mentioned above are to be seen, with the addition of *Aster Amellus* 'Sonia,' *A. × Frikartii* and *Rudbeckia speciosa*. Among the shrubby plants *Ceanothus* 'Gloire de Versailles' continues to flower supplemented by some very attractive varieties of *Hibiscus syriacus*.

Just before reaching the Laboratory a small tree of *Clerodendron trichotomum* will be noticed. It is a valuable plant for autumn display, the fragrant white flowers being followed by bright blue berries offset by the persistent crimson calyces.

At the foot of the walls are two small blue-flowered shrubs, *Caryopteris × clandonensis* and *Ceratostigma Willmottianum*, while the nearly allied but herbaceous *C. plumbaginoides* is springing up through cracks

in the terrace. *Kniphofia Nelsonii* with the foliage of *Senecio laxifolius* make a contrasting splash of orange and grey. Just inside the entrance *Amaryllis Belladonna* and *Nerine Bowdenii* are again creating a charming picture of bright pink against a background of soft grey.

BORDER CARNATIONS

Montagu C. Allwood, F.L.S., V.M.H.,

(Lecture given on July 11, 1950, to members of the Royal Horticultural Society and the British National Carnation Society, MR. G. W. LEAK, V.M.H., in the Chair)

FEW things can have a greater influence for good upon the mind of man than flowers, and there is no finer flower than the Border Carnation. Its wonderful influence upon developments in the large *Dianthus* family is remarkable, and this interesting fact is now fully appreciated. All the best races and strains, such as the Perpetual Flowering Carnation, etc., have *English* Border Carnation in them; in fact, all races of Carnations owe the quality of refinement in the flower to them.

Another interesting fact is that few, if any, plants are more truly British. For instance, it is safe to say that the Normans introduced *Dianthus Caryophyllus*, their wild ancestors, into England. Also, it is most interesting to follow the progress of the plants in this country throughout our history since 1066, at times almost too popular, and at others nearly neglected. However, with all these ups and downs they have always been considered one of the aristocrats of the Floral Kingdom, and like the Briton, their influence for good has spread over the whole world.

I contend that Floral Committees and Flower Shows, unless they are wisely guided, can be a real danger to the development of a plant. The Border Carnation has suffered in the past from too jealous or fastidious Floral Committees which at times turned the plant into a pampered pet, raised exclusively for flower shows instead of a really hardy border plant for the garden. Happily to-day, mainly thanks to our present Floral Committee, and also the R.H.S. trials held each year at Wisley, the garden merits of the plant have been exhibited, or rather emphasized to the public, also to the trade growers, so that to-day the Border Carnation is a better plant and more popular than it used to be.

We should recognize and appreciate the work of Floral Committees, especially in the case of florist's flowers; their duty is to recognize and encourage the development of plants' merits. Border Carnations, are classified into such colour groups as Selfs, White grounds, Yellow grounds, Picotees, Flakes, Bizarres, etc., a classification which may, in fact, seem rather confusing to the novice, but which in reality makes the study of them simpler and easier to understand. Then we have the hardy, or fool-proof race of Cottage type, which is bred from the old hardy garden kinds, but they have no exhibition value. I am not going to give you a list of varieties because you can collect them from the

catalogue of any good carnation specialist, also it is a matter of personal taste.

How to grow Border Carnations

In a garden there are naturally a few commonsense rules to observe, so let us consider for guidance the wild ancestor *Dianthus Caryophyllus*. Its native home is on the limestone mountains of Southern Europe. It is quite easy to deduce from this information the conditions which the plants prefer. For example lime is one of the essential parts of the plant's diet; this would be there in a perfect state for Carnations, mild and slow acting, never purging the soil of plant food. There would not be any acidity in the soil, on limestone mountains the soil would be sweet and pure, not too rich nor poisoned with highly concentrated chemical fertilizer. The roots of the plant would just be under the soil and not deeply planted. Carnations hate to have their stems deeply buried, it brings about stem-rot for which the scientist loves to give a long name. The roots of plants growing on limestone mountains would keep cool between the crevices, the sunlight would be good. All Carnations must have a direct light and be in a position where they can see the sun. Also the air would circulate freely around the plants, keeping the foliage dry and healthy—the appearance of Carnation leaves tell you that, the the bloom or glaucescence is their natural defence against pests and diseases. But the greatest benefit to plants growing upon the hillside would be that they would be growing in soil with a free drainage. These I contend are the essential conditions for growing all members of the *Dianthus* family really well. Similar natural conditions in your garden will keep them healthy and happy for a number of years.

Now if you consider all these natural conditions which were favourable for the wild ancestors of the Border Carnations, so that they naturalized themselves and carried on from age to age, you should be able to locate the reason for any previous failure in growing Border Carnations in your own garden, and correct them. I am sure of this, that every obstacle can be overcome provided you can locate the cause of your previous failure. For instance, in many old town gardens, the soil is quite rich enough for Carnations, often it is too rich, and there is also acidity in the soil, which is most harmful to all members of the *Dianthus* family. Limestone Rock is the natural and best form of lime for all types of *Dianthus*, also for any type of soil. Anywhere in the world where we find *Dianthus* growing in a wild state limestone rock is always in the soil itself, or else forms the sub-soil or foundation of it. This is a remarkable fact—but what is more remarkable still is that while this was recognized, few, if any commercial growers used limestone chippings themselves, or offered them to their customers. Also, the horticultural chemist considered all forms of lime the same. This is not so; there are a great variety of limes. The old idea, which was reasonably sound, was to use crushed chalk for very light soil, old mortar rubble for soil of medium texture, and quicklime for heavy or clayey soil. But I have conclusively proved to my own satisfaction that limestone, either as dust for light soil, or as chippings for other soils, supplies lime in the perfect form. and does not purge the soil, but in some

wonderful way counteracts acidity in the soil. You notice that in some soils the chippings will remain present for several years, while in others they dissolve and gradually disappear. The fact is, that acidity is the mortal enemy of all *Dianthus*, causing disease and eventually death to the plants, but as long as limestone is present in the soil, there will not be any acidity.

It has always appeared to me that limestone was the foster-mother of all the Carnation tribe, and the one essential element which has been neglected by all. You will rarely, if ever, find it so much as mentioned in the old books on the subject of Carnations.

The best way of using limestone is to top-dress your soil with it. The main use of lime in the soil for Carnations is that it liberates and makes available valuable plant food in the soil, and also acts as a tonic to the plant.

Burnt Earth

The great value of this consists not only in the potash it contains and its special help in lightening and giving drainage to heavy soil, but also in the wonderfully stimulating effect it has upon root action, especially with all members of the *Dianthus* family. It supplies something which is beyond the reach of the chemist. However, use it sparingly because you can have too much even of a good thing! Undoubtedly, the best burnt earth is obtained from burning heavy clay soil, but a good substitute is bonfire ashes, providing a good proportion of soil is burnt with the refuse.

Planting

You can plant Border Carnations in your garden during Autumn, Winter or early Spring. I prefer Autumn planting because the plants will produce more flower during the following summer. However, it is not wise to plant them closer together than 12 inches; but in a favourable position where the plants will remain for several years, not less than 18 inches between each plant is wise, although not absolutely necessary.

The expert grower, both amateur and professional, who produces these flowers of exquisite perfection for exhibition, produces them from plants growing in large flower pots with the protection of glass. They layer their plants each summer so as to get the first flowering from young plants, but this is not necessary for a garden display, because the old plants should make great clumps in the garden under favourable conditions.

Never forget that Carnations, indeed, all members of the *Dianthus* family, resent being grown on the same soil year after year, because they take from the soil a little more than we quite understand. We cannot replace with a Carnation food all that they extract from the soil. Its hidden powers, and the somewhat speculative results which we may or may not obtain from it, add to the glorious uncertainty of horticulture, for none of us is dead to the pleasure of hope.

Layering

Layering is a natural process of propagating some classes of plants which emit roots at nodes and joints when in contact with moist earth.

In the case of Border Carnations we take advantage of this phenomenon by deliberately cutting the stem through a joint. It will be recognized that plenty of strong roots at the commencement of the plant's life form the essential foundation on which to build its future growth and well-being. A rooted Carnation layer should be potted off into a small-sized pot previous to being planted out in the garden.

In a short space of time it is impossible to deal with every aspect of the life of the Border Carnation, and so such topics as Layering, are best described with the aid of a film or lantern slide. While, as to methods for dealing with the various grades of soil, heavy, poorly drained, or its opposite, light sandy soil, all this information can be read in books, remembering that all Carnations dislike peat and leaf mould, but enjoy in moderation, limestone chippings and ballast. This we must remember, that Carnations are distinct from all other forms of plant life, so that in the matter of artificial feeding you must have a slow acting food and not a highly concentrated fertilizer, and this information should be obvious to all thoughtful growers.

The Scent of Carnations

It is a common notion that we have lost much of the fragrance in our modern varieties of Carnations, but I have always contended that you never get bright colours in any member of the *Dianthus* family with a strong scent. Fragrance, and especially that delightful Clove perfume, is only found with any noticeable strength in whites, crimsons, dull reds or pinks, and so on; a few yellows have fragrance, but, at least it is only discernible on most favourably warm and sunny days. Our ancestors, who so appreciated fragrance in flowers and popularized the Mignonette, Heliotrope, Violet, Lily of the Valley, etc., were content with imperfect and small blooms with dull colouring; they did not demand everything in a single flower.

Undoubtedly, the introduction of yellow-coloured Border Carnations, especially the German kind "Germanier," weakened the fragrance in the offspring—this we all readily admit—yet at the same time it did light up the colourings in brilliancy, especially all the beautiful yellow-ground varieties, coloured varieties raised by that master hybridist, MARTIN R. SMITH. Here again you do not get all the virtues in a single bloom. Yet the public get a government they vote for, also the kind of Carnation they will pay for, and, strangely enough, they expect the perfume of a Carnation gratis. If you claim richness of perfume in a new kind, it does not enhance sales to any great extent; you generally find that the public only complain of a Carnation if it has only a little fragrance; yet they hesitate about paying more money for the plant that has beauty enhanced by fragrance.

It is perfectly easy to breed varieties with rich perfumes if you put that quality first, so sacrificing bright vivid colours, which usually attract the most attention, and therefore have the greater selling value. However, we are now developing the Clove perfume in certain new kinds of Carnations in all the various types, or races, because we think that in these days of small gardens, and the appreciation of details, as the Victorian appreciated them, fragrance will come back into favour; yet

the inference is that you must be prepared to sacrifice brightness in the colours of the flowers, and, all too often, the size also of the flower, which, in itself, may be a good thing, showing that anything which is over-developed loses some of its natural virtues.

Border Carnations from Seed

The most important step is to obtain the best seed procurable, whether bought from a specialist, or home-saved, because it will be seen that this plays the principal part, otherwise valuable time, room, labour, money and interest will be wasted in fondling seedlings predestined to fail. The principal aim in view should certainly be to raise a seedling of excellence; coming as near as possible to perfection in all respects.

Sow the seed thinly, and cover it with never more than $\frac{1}{16}$ th inch of soil. Through a fine rose allow sufficient water to reach the bottom of the pan. In 4 weeks prick off the seedlings in seed trays. Spring and Summer are the best seasons for sowing.

To succeed in cultivating any plant, you must first of all learn its requirements, its likes and dislikes, all of which you gather from books, but all the details in its cultivation, which are mainly peculiar to your district, these you must discover for yourself or glean the information from your neighbours, and here I consider is the reason why we gardeners are such a happy folk—we like helping each other, in fact we feel a wee bit flattered when others consult us.

If we in Sussex have any secret in our success in growing Carnations, it certainly is not the district. We have to cope with a heavy rainfall, and tenacious soil. Perhaps our use of organic manure exclusively, and also of burnt earth and limestone, materially improves the mechanical conditions of our soil in Sussex, with such stimulating effects upon the root action of all members of the *Dianthus* family. It is that little essential something which is beyond the reach of the elements. And so you too can experiment in the methods of growing your plants—that is the sport of it all, the study and perfecting of details until perfection is reached.

One is always being asked for a selection of the best varieties, and it is quite easy to supply names—in fact there are few bad kinds—but these can be obtained from any reliable Carnation catalogue. You select the colour you prefer personally, I should put the Clove-scented kinds first, perfume which made the Carnation famous. All these kinds have the word "Clove" after their names. Next I should place the Cottage kinds for garden display and extreme hardiness, then you can add the more perfect Exhibition varieties of Border Carnations, which have reached a high stage of development in perfection, in all details of the flower. The old Picotees are too beautiful to be excluded from any collection; then you have White-ground and Yellow-ground coloured varieties. There is a wonderful feast of colour in the Border Carnations.

THE COOKING OF VEGETABLES

Monsieur J. Vincent

*(Lecture given on June 13, 1950, MR. F. A. SECRETT, C.B.E., F.L.S., V.M.H.,
in the Chair)*

IT is difficult to understand why the vegetables are treated so badly by so many cooks or would-be cooks, and also why so little imagination is used in their preparation. Very often one may think that in early spring there are only spring cabbages; in late spring, peas; in summer runner beans, and in winter either savoy or sprouts. It is surprising how comparatively few people know what spinach is, or chicory, or globe artichokes, and many other vegetables. The aim of this lecture is to give you an idea of how the same vegetables can be cooked in different ways—and how the mixing of some of them can produce an attractive range of dishes.

Fortunately, we are in a season where everything in the garden is young, or should be, and at its best; and I want to stress one point, which is, that whatever your choice, make sure that what you are buying is fresh. There is no flavour left in vegetables that have been first overheated in packages and left on the shelves of the greengrocer, with the sun shining on them all day. The ideal is to gather vegetables before the sun is hot and to cook them as soon as possible. Too often vegetables are gathered during the heat of the day, placed in bags or boxes without being cooled off. The result is that with peas, for instance, 60° of heat can be registered in the bags sent to the market. Whatever the cook does with these, he will never recapture the freshness they possessed when picked. It is also useless to buy peas or beans, for instance, which are old, that is, which have passed their best. Like human beings, they deteriorate when they grow too old, which is a consolation for us all.

Now, let us see what the good earth gives us at this time of the year! Spring cabbages, peas, French and broad beans, asparagus, tomatoes, marrows, cucumbers, lettuce, and new carrots, turnips, potatoes, spring onions, and from abroad Globe artichokes; quite an array!

Let us take each one separately and see what we can do:—

Spring Cabbage. Why must this much abused individual be always cooked in rivers of water? Why throw all its goodness away? Try to cook it in these ways.

After it has been trimmed and washed, shred coarsely. In a stew-pan, place a piece of butter, or bacon fat, allow to heat up, throw in your cabbage, stir with a wooden spoon, on a low fire; when it has become limp, add salt to taste and cover with a lid. Cook until tender, very slowly. When cooked add a little pepper. That's all. Another way: Cut up roughly and cook in just enough salted water to cover; drain well and replace in a saucepan, adding some butter and a little pepper. Never add pepper when cooking, but just before serving, it makes all the difference. Now, do you want something more elaborate? Very well.

Later in the season, when cabbages are well hearted, select a good firm one, trim it and wash well. Cook whole in salted water for about five to eight minutes. Remove carefully, drain, and place on the table. Open each leaf one by one flat on the table. Have a farce consisting of good pure sausage meat, chicken liver passed through the sieve, a little bread-crumbs, chopped onions previously cooked, one or two eggs, season well. Spread the mixture on each leaf, $\frac{1}{4}$ inch thick, starting by the middle and continue until the cabbage is completely reformed, place in a braising-pan, add two or three cloves, six peppercorns, and cover half way with a good brown stock. Season, bring to the boil and braise, covered, for about one hour. Remove carefully on a dish, reduce the stock to a liquor and pour over. All varieties are good for these ways of cooking, although I prefer 'Winnigstadt' for the two former ways. There are other ways of cooking them but I have not the time to deal with them.

Peas. There are several ways of cooking peas. The most common being with mint, but even this simple way of preparation is very often a sham. A good amount of mint is required and very often sugar, which is scarce, and here again not too much water; salt is often forgotten, but soda is always thought of. Why? If the peas are hard, no amount of soda will make them tender or palatable, so why use it? To keep them green? Try some coarse salt, it is much better. I think that much more discrimination should be exercised by the housewives when buying peas. How many times have I seen women buying peas which were good enough for the compost heap? Often because they are cheap, but are they? First, they will not cook, therefore wasting fuel, and secondly they are not eaten, which is throwing them away, so, why buy them at all? One French way of cooking peas is as follows: they are called *Peas à la française* (French style). For one pint of freshly gathered and shelled peas, one lettuce, six new button onions, one ounce of butter, a level tablespoonful of sugar if the peas are not sweet enough, or less if they are; salt and pepper to taste; six tablespoonfuls of water. Place peas, onions, seasoning, water in a saucepan; cut the lettuce in four and add to the rest, shake the saucepan a little and let it stand for fifteen minutes to half an hour. Cook fairly quickly, keeping covered all the time. Quite simple. Some people add a little flour and prefer it. If you want to try it, add one dessertspoonful to the lot and proceed as stated before. If you want to give it a different taste, add two or three sprigs of savory or sage, the taste is quite pleasant. You can also add a few new carrots cut in four, and a few very small lardoons of bacon, previously parboiled. But for those who dislike these mixtures, if you cook your peas in salted water, drain them well and add a good amount of butter and a little sugar, toss the lot well together, you will have there, something excellent, but remember that the peas must be fresh and the butter of first quality (varieties, *Petits pois*, 'Little Marvel,' etc.).

French Beans, or Runner Beans. With these, there are also several ways of preparation. French beans are usually gathered far too large and are therefore stringy, and this can be very annoying when eating them. As regards runners, no cutting up and no machine will make them tender when they are tough. And why buy them tough? You have

to remove half of them and it takes time, so when you have finished they cost you double what you have paid for them.

Here again, why use soda? It is quite unnecessary, and coarse salt is the best. Fifteen minutes boiling should be enough, if it takes longer it is because they are tough. When cooked, drain well, replace in the saucepan, add a knob of butter, some finely chopped parsley in relative quantity and a little pepper. Toss together without heating. Or try this way: Heat some butter in an omelette pan, when it begins to sizzle, throw the beans in, and allow them to colour lightly, tossing from time to time, sprinkle with chopped parsley just before serving. French beans can also be finished with fresh cream in place of butter. Proceed as follows: after being cooked, drain perfectly, replace in the pan and add a relative quantity of fresh cream, or top of the milk (as we have no cream to use yet).

While we are on the Beans subject, I must mention the fresh haricot bean, the Soissons Climbing Variety, and the Green Flageolet Bean or Chevrier. These two varieties are excellent in the fresh haricot beans form. Cook them in salted water with a faggot of parsley. Drain well and toss with a good piece of fresh butter and a sprinkling of chopped parsley. For those who like it, an onion cooked with them gives them an attractive flavour. In the dry stage, buy the Haricot *Comtesse de Chambord*, cooked with a small onion with a clove inserted, a small whole carrot, a small faggot consisting of parsley, one small sprig of thyme and a fragment of bay leaf. A piece of streaky bacon can be added to it, cooking it together. These can be finished with a knob of butter and chopped parsley or, when drained, can be added to a good tomato sauce.

Lettuce. When lettuce are plentiful, why not try to braise them? It is a change from the eternal salad, very often badly seasoned. The process is simple. Clean and wash the lettuces, plunge into boiling salted water and cook for several minutes. Remove them and refresh. Press them gently to remove all water. Place in a saucepan side to side, add a good piece of butter, salt and pepper to taste, and barely cover with water. Allow to boil gently for about 30 minutes. (This is the simplest way of doing it, the professional way would be too long for the ordinary housewife.) When cooked, remove from the pan, reduce the liquor quickly to a syrup and add one or two tablespoonfuls of cream. Pour over the lettuces and serve.

Spinach is an excellent vegetable, very often as maltreated as the cabbage. Generally speaking, too much water is used for cooking it. After being washed several times and lifted out of the water, plunge in 1 inch of boiling salted water, turn over and over with a wooden spoon and cook for five or six minutes. Tetragonna or New Zealand spinach needs a little longer. When cooked remove in a colander and press strongly to remove all the water. Now, two ways are open to you for the finishing touch. One: place a piece of butter in a pan and throw the spinach in, as it is, season with a little salt if necessary and a little pepper, warm thoroughly. If you like it, a little crushed garlic is added to it. This is the Spinach *à la Florentine*, minus anchovy filets. Two: Put the spinach through the mincer or through a sieve. Place some

butter in a saucepan and allow to sing. Add the spinach and heat thoroughly, stirring with a wooden spoon. When hot, add one-third of the volume of Bechamel sauce and a relative quantity of cream, or add cream only if preferred. Season to taste, salt, pepper and one or two rasps of nutmeg.

Marrows. As you know, this vegetable is 95 per cent. water, so why cook it in water? And why use them when they are very large and very coarse? Try this way: Peel and cut in halves, lengthways. Cut in half again and slice $\frac{1}{8}$ inch thick. Prepare a relative quantity of *concassées* tomatoes, that is, peeled, cut in half, remove pips and water and cut in pieces $\frac{1}{4}$ inch square. Chop a small onion, finely. Heat two or three tablespoonfuls of olive oil in an omelette pan, when smoking hot add the sliced marrows, and toss now and then; after two minutes add the chopped onion and continue to cook, tossing it together now and then; when nearly cooked, add the tomatoes, season to taste and continue to cook with a lid on. This will take about ten to fifteen minutes. When cooked sprinkle with chopped parsley, mix and serve. Large marrows are not used on the Continent. They take them when 7 or 8 inches long. They are peeled, parboiled, the pith removed, and stuffed with cooked rice, mixed with mushrooms or chicken liver or even sausage meat and baked with either brown gravy or stock. They may be sprinkled with grated cheese and bread-crumbs and *gratinées*.

Choux fleur Polonaise. There are better ways of preparing cauliflower than just plain boiling, and this is a simple way of preparing them, although it is, in my opinion, one of the best. When the cauliflower has been cooked in buds, it is drained and tossed in nutty butter, well seasoned, and placed on the service dish. The rest is prepared as follows: Place a good piece (two ounces) of butter in an omelette pan, when it begins to sing add three or four tablespoonfuls of fine bread-crumbs and allow it to become a golden colour, tossing it all the time, on a good fire. When it is nicely golden, add one finely chopped hard boiled egg and one teaspoonful of chopped parsley. The mixture will become frothy, it is the time to pour it over the cauliflower which has been kept hot in the meantime.

Now there is something quite easy to prepare and which is good if you possess a garden with all sorts of vegetables ready to pick. Gather an equal quantity of peas, French beans, carrots, turnips, new potatoes, small spring onions, two sprigs of parsley, one sprig of thyme, one fragment of bay leaf, two leaves of sage or savory. Place all this in a saucepan, the larger vegetables cut up to a reasonable size, add a good piece of butter, salt and pepper to taste, cover half-way with water, place a lid over the whole and cook briskly for twenty to thirty minutes. Practically all the water will have evaporated when it is cooked. You may add three or four tablespoonfuls of cream and allow it to boil, and serve. I think you will like it.

SOME NEW VIRUS DISEASES OF ORNAMENTAL PLANTS

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THE statement has been made often enough in recent years that virus diseases of plants have greatly increased in number and many viruses, of importance now, had not been heard of a few years previously. There can be little doubt that virus diseases of plants are increasing in number and importance, and that apparently new viruses are continually turning up. Some of these appear for a time and cause some trouble and then disappear again, remaining only as subjects for study in virus laboratories. Among these may be mentioned the viruses of Tomato bushy stunt, Tomato black ring, Lovage mosaic, *Arabis* mosaic, and others.

The explanation of the appearance of previously undescribed viruses is not easy. It can no doubt be partly explained by the importation of virus-infected vegetative parts of plants from abroad, as witness the Lily virus disease described in this article. The same is probably true of the Tulip viruses which are dealt with here. But this is not the whole explanation, and we do not know where the two viruses, which suddenly appeared in *Tropaeolum* in the same garden, have come from.

Whilst the virus diseases, briefly described here, are all new so far as the writer is aware, it is not yet definitely established that the causative viruses are all new ones although some almost certainly are. Further work may show that some of them are related to, or may be strains of, viruses which have been already described. The Lily viruses may have affinities with Cucumber mosaic virus which is known to appear in a variety of very different strains, and one of the viruses from *Tropaeolum* may be related to a virus of great economic importance which attacks brassica crops. A good deal more work must be done on the eight viruses, briefly dealt with here, before it can be said definitely whether they are, or are not, related to any of the known viruses.

In the meantime, it may be of interest to give a short description of these virus diseases which affect well-known ornamental plants so that the reader may recognize them if they occur in his own garden plants.

LILY RINGSPOT VIRUS

Hybrid Lilies from the U.S.A., showed a faint mottling of the leaves which later disappeared. The plants were not stunted and appeared otherwise normal with normal flowers. Inoculation from these Lilies to the usual test plants produced a virus disease of very characteristic appearance on tobacco and *Nicotiana glutinosa*. The symptoms consisted of concentric rings with a central spot, ring and line patterns, and, in *glutinosa*, a characteristic yellow veined mosaic. (See Fig. 185.) According to the literature on the subject, the only virus recorded from Lilies which also attacks tobacco and *N. glutinosa* is that of Cucumber mosaic. So far as the tests go they suggest that this virus is

not a Cucumber mosaic virus. There seems to be no cross protection when a special "white" strain of Cucumber mosaic virus is used to test a possible relationship. However, these tests are not conclusive and do not preclude an affinity to Cucumber mosaic virus which may be revealed when more experiments have been done and when it is possible to test the serological relationships of the virus.

Experiments to find the insect vector of this Lily virus have shown that it is transmitted by the common aphid *Myzus persicae* which can pick up the virus after a short period of feeding.

Transmission of the Lily ringspot virus to such Lilies as *L. tigrinum* and *L. regale* reveal the potential importance of the virus in this country. About ten days after inoculation, dark ring-like markings develop on the leaves. These change rapidly into dead (necrotic) areas which spread through the plant. The growing point is killed out, and no flowers are formed; the whole plant is stunted, twisted and deformed. (Fig. 184.)

In the case of *L. tigrinum*, the plant may be killed outright, but with *L. regale* a certain amount of recovery has been observed, in that the plant continued to grow although it failed to flower.

It is rather curious that the reactions of the American and the English Lilies to this virus should be quite different, so mild in the former and so severe in the latter. It is possible, however, that a clue to this is contained in the apparent partial recovery of *L. regale* infected with the virus. It may be that next year this plant will show only the mild mosaic characteristic of the virus in the American species of Lily. In other words, the initial disease may be severe but after that, if the plant survives, a kind of balance is struck between virus and plant. Judging by the high percentage of infection among the Lilies from this consignment from U.S.A. something of this kind seems likely.

Among the large number of Lilies infected with the ringspot virus was one which contained a virus differing slightly from the first. This virus, also of the ringspot type, produced no visible symptoms on the American Lily and does not appear to infect *Nicotiana glutinosa*. Its reactions on Lilies in this country have not yet been studied.

WHITE STREAK OF TULIPS

Up till recently, with the exception of the classical Tulip break virus, this plant has been fairly free from virus infection. Now, however, the situation seems to be changing. We have seen the recent infections of tulips with the virus of tobacco necrosis which seems to be widespread and now there are two more apparently new Tulip viruses to record.

The first of these causes a disease, tentatively called *white streak of Tulips*, and is illustrated in Fig. 186 (top left). The leaves are covered with white streaks or stripes running parallel along the length of the leaf as shown in the photograph. The affected plant was abnormally small and stunted and the flower was also small and degenerate. At first sight, the plant was thought to be infected with the tobacco necrosis virus but inoculation tests showed that this was not the case. The symptoms produced in tobacco and *N. glutinosa* were extremely characteristic and consisted of very large circular necrotic lesions which gradually increased in size. (Fig. 186 (top right).) So far the symptoms produced on the test

plant have all been necrotic, that is to say, the cells are always killed; no mosaic mottling has been observed. As a rule the virus remains confined to the inoculated leaves of tobacco and *N. glutinosa*, but not always. In tobacco the virus may travel up the leaf petiole and enter the stem, killing out a circle of the stem in a characteristic manner. The xylem is apparently unharmed as the plant continues to grow and the only effect of the virus remaining is the characteristic blackened circle at the base of the stem.

On *N. glutinosa* the virus sometimes spreads right through the plant killing the tissues as it goes. Such a plant remains in a moribund condition until it finally dies.

There is no information yet on the method of spread of this Tulip virus; tests with the aphid *Myzus persicae* have so far proved negative. It may, however, be carried by another common species of aphid which is frequently found on Tulips. The virus, which is not quite like any with which the writer is familiar, has some of the characteristics of the virus of Tomato spotted wilt but differs from it in its capacity to remain infective in extracted sap for four days or longer.

Since Tulips this year, generally, have shown many symptoms of disease, some further tests were carried out on a number of Tulip plants, and a second virus was isolated from a Tulip showing numerous dead patches on the leaves. Not much is known as yet about this second Tulip virus and it is only briefly mentioned. On *Nicotiana glutinosa* the virus produces small circular lesions and on French Beans it gives rise to numbers of small discrete lesions of a reddish colour which later turn paler. They do not spread at all and this differentiates them at once from the lesions caused by the tobacco necrosis which is now commonly found in Tulips.

TROPAEOLUM RINGSPOT

Two years ago in the writer's garden a single plant in a row of Broad Beans developed a characteristic mosaic disease which was quite different in appearance from the ordinary Broad Bean mosaic. The leaves were blistered and crinkled with patches of dark green on a light green background. Inoculation tests to tobacco and *N. glutinosa* showed that the bean was infected with an apparently undescribed virus of the ringspot type. (Fig. 186 (bottom left).) Later in the year a number of Nasturtium (*Tropaeolum*) plants, some distance from the Broad Beans, also developed a disease consisting of mottling of the leaves with necrotic spots and a stunting of the whole plant. Tests showed that this disease was caused by the same virus which had been observed earlier in the Broad Bean plant. The virus has a wide host range and will infect a variety of ornamental plants including the Petunia. On the flowers of this latter plant it sometimes produces large numbers of concentric rings, giving a most bizarre effect to the petals. The virus is carried by the black Bean aphid, *A. fabae*, and by the Potato aphid, *Myzus persicae*.

TROPAEOLUM MOSAIC

In the year following the appearance of the ringspot virus in the Nasturtiums, a second virus disease was observed also in Nasturtiums

which had arisen from seed remaining over from the previous year's crop. The symptoms differed somewhat from those of the first disease in being a brighter mosaic mottling, with less distortion of the plant. (Fig. 186 (bottom right).) The flowers showed a distinctive colour break. This virus could also be easily distinguished from the first virus by its reaction on various test plants. It somewhat resembles in its symptoms on *Nicotiana glutinosa*, the disease caused in the same plant by the Cabbage black ringspot virus which gives rise to the well-known colour break in Wallflowers. This latter virus, however, does not appear to infect *Tropaeolum*. Experiments have shown that *Tropaeolum* mosaic virus is also transmitted by the aphid, *Myzus persicae*. The black Bean aphid has not been tested as a vector of this virus.

It is rather interesting that two apparently undescribed viruses should occur in successive years in the same plant species and it might be thought that the second virus is a mutation or derivative of the first. However, such experiments in cross-protection which have been carried out do not seem to support this theory.

Two other apparently undescribed viruses affecting ornamental plants are described briefly, but not much study has as yet been carried out on them and the method of spread is not known.

The first was found infecting some plants of *Phlox paniculata* in a garden in Cambridge. There was very little mottling but the leaves were grossly distorted with the leaf blades reduced, in some cases, to mere strings (Fig. 187). Inoculation to the usual test plants gave a virus which produced a faint ring and line mottling on tobacco. On *Nicotiana glutinosa*, however, the symptoms were very much more severe; something of the same distortion exhibited by the infected *Phlox* plants developed together with large patches of dead cells. Such plants are frequently killed outright. Preliminary attempts to infect the Cucumber plant with the *Phlox* virus were unsuccessful.

The second virus is somewhat unusual because it was isolated from a *Buddleia* sp., probably *B. Davidi*, some branches of which had been sent in for examination. So far as the writer is aware, no virus disease of *B. Davidi* has been recorded before. The leaves showed a typical mosaic mottling with a certain amount of crinkling and distortion (Fig. 188). Inoculation to tobacco plants gave a mottling disease of dark and light green patches without any of the usual ringspots. No infection developed in *Nicotiana glutinosa* or Cucumber.

It should perhaps be emphasized that neither the *Phlox* virus nor that from *Buddleia* has as yet been carefully studied and further work may suggest relationships of these two viruses with other viruses already described.

AMATEUR PLANT HUNTING IN THE ANDES

M. W. Spitta

FLYING low over the Argentine plain, from Buenos Aires southward for some 600 miles, on the first stage of a trip to the Argentine and Chilian lake districts, in the middle of October, in a small plane which reflected every ripple of the fields below, we tried to picture the English garden plants we might expect to find out here in the wild. I knew that some of the Barberries came from South America, that Embotriums and Eucryphias grew in Chile, and it seemed likely that the so-called southern Beeches would appear in this part of the world, latitude 42° S. Of other tender species which might have become established in our milder districts at home I had little knowledge, my acquaintance with English gardens being confined mostly to those of the southern counties. I emphasize this ignorance, because I hope what follows may be an encouragement to other amateurs like myself, who without being a botanist or a horticulturist in the expert sense, was yet able to enjoy all the thrills of identifying familiar and unfamiliar species in distant places, to find plant hunting one of the absorbing pursuits of the world.

Driving from Bariloche airport on Lake Nahuel Huapi, our destination on the Argentine side of the Andes Mountains, the eagerness with which we looked around us can be imagined. It was early spring here in the southern hemisphere—what should we find? Building plots lined the road to the hotel for the most part, but in between glimpses of wild *Berberis Darwinii*, of patches of ground-purple (a brilliant form of vetch, sky blue and maroon) and here and there what looked like a stocky yellow Orchid in the grass increased the excitement. The next day we rowed around the lake and seeing a scarlet flower (the Chintral) among the high overgrowth of the cliff, found a landing place, pushed our way in and thus found ourselves, without warning in virgin forest of *Nothofagus Dombeyi*. Therafter we found that the Coigues, (the common name for this species in South America) covered the mountain sides above the lake, and grew all over the countryside, except for widespread clearings for buildings, mostly hotels and lakeside chalets, in spite of the area having been scheduled as a national park so long ago as 1906. I had seen *Nothofagus Dombeyi* in English parks and gardens, some growing well, others rather ragged, but none to the best of my recollection more than 20–30 feet high. Here in the Argentine forest trees 120 feet high were quite usual, up to 150 feet were not uncommon and by sun and shadow we calculated several to be 175 feet high, with a girth of 18–22 feet at 5 feet from the ground. It has been said that the Coigues combine massiveness with grace. (Fig. 183.) No truer description could be given of them in the wild, whether seen from the forest roads, over which they form an immense transcendent canopy, or standing among them on the mountain sides, their giant boles chequered with olive-dark glistening leaves, in no way sombre but giving an impression of fern-like coolness. Beautiful as they are grown as lone specimens, with branches skirting the ground, I doubt whether anyone who has



Photo, W. Abbing

BORDER CARNATIONS

Fig. 177—The super-hardy Cottage Border Carnation bred from the old English variety 'Rifleman'



Photo, W. Abbuz

BORDER CARNATIONS

Fig. 178—Light and heavy-edged Picotees



Photo W. T. King

BORDER CARNATIONS

Fig 179—Fancy Border Carnations



Photo W. A. Young

BORDER CARNATIONS

Fig 180 Border Selfs



Lewis, W. A. Long

BORDER CARNATIONS

Fig. 181—Bizarres The old Elizabethan type of Carnation

Fig. 182.—A bank of *Emboellium* along Lake Llanquihue with Mt. Osorno in the background (See p. 357)



AMATEUR PLANT HUNTING IN THE ANDES

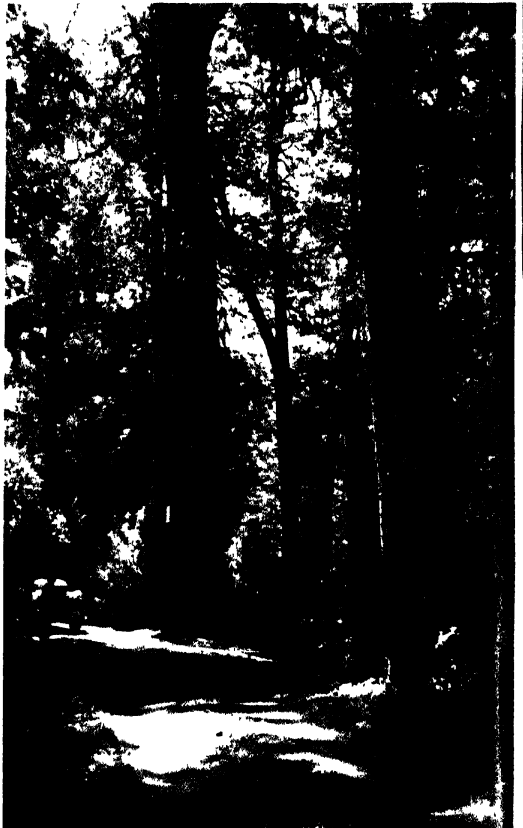


Fig. 183.—*Nothofagus Dombeyi* in Argentine woodland. 'The placard on 'Abuelo' (grandfather) in the centre gives a girth of trunk of 18 feet 5 feet from the ground, its age 600 years' (See p. 354)

Fig. 184 - The plant on the right is a hybrid Lily from U.S.A. infected with the Lily ring-spot virus, the plant on the left is *L. tigrinum*, which has been inoculated from the American Lily (See p. 350)



SOME NEW VIRUS DISEASES OF ORNAMENTAL PLANTS

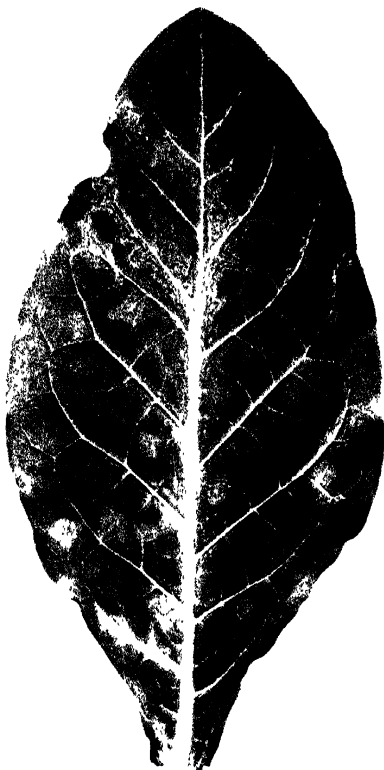
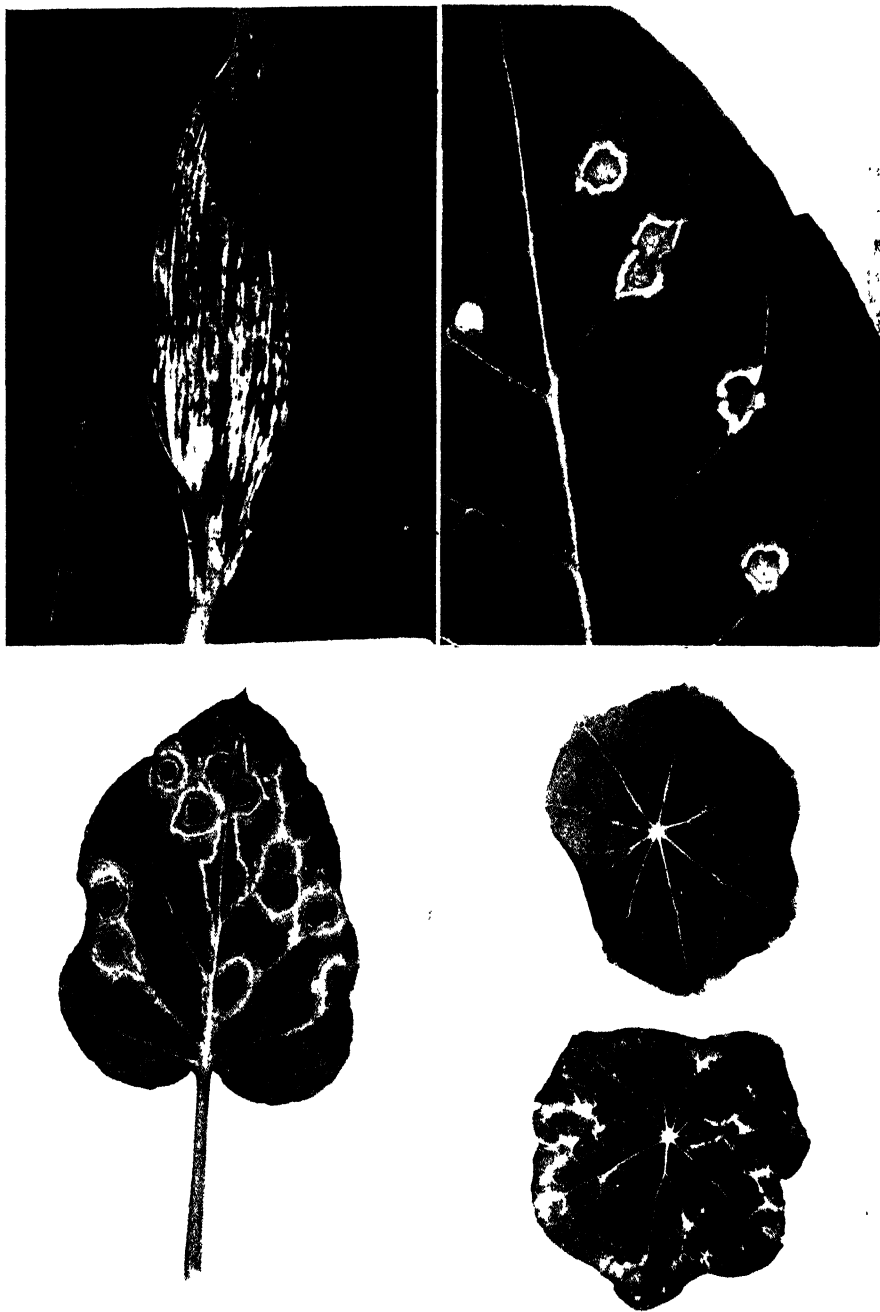


Fig. 185—Leaf of Tobacco showing the symptoms produced by the Lily ring-spot virus (See p. 350)



SOME NEW VIRUS DISEASES OF ORNAMENTAL PLANTS

Fig. 186 (top left) Leaf of Tulip showing the symptoms of the white streak disease (See p. 351)

(top right)—Leaf of Tobacco inoculated from the Tulip shown on the left. Note the curious lesions which develop (See p. 351)

(bottom left)—Leaf of *Nicotiana glutinosa* inoculated from a plant of *Nasturtium* infected with *Tropaeolum* ring-spot virus (See p. 352)

(bottom right)—Leaf of *Nasturtium* showing symptoms of *Tropaeolum* mosaic, normal leaf for comparison above (See p. 352)



SOME NEW VIRUS DISEASES OF ORNAMENTAL PLANTS

Fig. 187—Leaves of *Phlox paniculata*, infected with a virus. Note the great distortion of the leaves. (See p. 353)



SOME NEW VIRUS DISEASES OF ORNAMENTAL PLANTS

Fig. 188—Leaves of *Buddleia*, probably *B. Davidi*, infected with a mosaic virus. Note



Photo G. H. Addison

HORTICULTURE IN SINGAPORE

Fig. 180—*Spathoglottis* 'Dwarf Legion,' var. 'Sunrise' One of the best of the third generation *Spathoglottis*.



Photo, Massers, Malton

FIG 100—*Iris susiana* in COL. C. H. GREY'S garden at Malton, Yorkshire

Fig. 191.—The first *Cypripedium* hybrid raised in Singapore, April 1950. *Cypripedium* 'Millmanni,' Botanic Gardens, Singapore



Fig. 192. Aranda 'Alastair' (*A. Hookeriana* × *V. limbata*) at the Botanic Gardens, Singapore, May 1950. One of the new free-flowering Vanda-Arachnis hybrids. (See p. 365)



Photo, Dr. Stewart

Fig. 193—*Myrtus Lechleriana* in Cornwall (See p. 360)

seen them growing closely in their natural groves would ever again choose to plant them singly, unless for economy of space.

We were told by the head forester of the arboretum at Temuco that the seed of *N. Dombeyi* loses its vitality very quickly. This may be true of others of the genus, hence the failure of so many seeds which have been brought over, even by air, to England, and the importance of getting them off in as fresh a condition as possible. The woodland floor under the Coigues was noticeably thin, and though we searched in likely pockets for old seed, found none.

Of other *Nothofagus* species on the Argentine side we found only *N. antarctica*, which appeared always on low-lying swampy ground, and what we believe to be *N. pumilio*, in young spring green, growing high up above the Coigue line and living apparently happily on the fringe of the snows; we were told that it grows up to 6,000 feet above sea level. It was generally difficult to get reliable information, however, the common names covered such a wide field—the 'Roble' for instance being the colloquial name chiefly for *N. obliqua*, but including also *N. antarctica*, *betuloides*, *nitida*, *pumilio*, and even *Quercus pedunculata*!

Associated with *N. Dombeyi* in the Argentine forests were *Aristotelia Macqui*, *Lomatia obliqua* (radal) and *ferruginea* (what other genus produces two such dissimilar species?), *Laurelia serrata* and *aromatica*, *Weinmannia trichosperma*, *Azara microphylla* and *lanceolata*, *Desfontainea spinosa* and *Myrtus Luma* (*Eugenia apiculata*), trees up to 40 feet high, all showing the characteristic milk-white patches under cinnamon bark. The beauty of *N. Dombeyi* and *Myrtus Luma* growing together in the wild was striking—particularly in glades which had been cleared of undergrowth and the usual forest debris of fallen tree trunks, when half light intensified the contrast of copper and platinum grey stems, and accentuated their extraordinary flair for grouping in attitudes of utmost grace.

Of shrubs in the Argentine Lake district, *Berberis Darwinii* was coming into flower when we arrived and reached its peak in ten days. It cropped up everywhere, from straggling plants in the woods to big clumps scattered thickly over open commons, as with gorse country at home, only turning clear orange instead of gold. *Berberis linearifolia*, more fastidious and less prevalent than *Darwinii*, we first found in what are probably ideal conditions, clearings among light scrub on the damp margins of a stream running through sheltered ravine. Here, *Darwinii* and *linearifolia* were crowded together, the latter dominating and growing faster, with seedlings of the hybrid *lologensis* thick on the ground between, displaying every variation between the parents as to leaf; we did not see one in flower. Given congenial conditions and room to spread, there was nothing to choose between *Darwini* and *linearifolia* seen en masse at a distance either as to stature or degree of flowering; but the more tender flame-pink colour of *linearifolia*, and its larger flowers, to us gave it first place, deserving of more perseverance and widespread cultivation in English gardens than it appears yet to have had. The importance to it of moisture was very evident in the wild. Of other barberries we identified *B. buxifolia* by the leaf, but there were several others we did not know, including one with rather a glaucous

leaf and arching sprays crammed with yellow very fragrant flowers. We found also *Fabiana imbricata*, *Colletia armata*, *Buddleia globosa*, and *Pernettya mucronata*. The pernettyas grew abundantly, on the undersides of banks overhanging the roadsides, in clearings of the woods, among boulders by the water's edge, but always shaded on one side. A particularly beautiful variety, which seemed to prefer woodland conditions, grew 4-5 feet high, its flowers, like Lilies of the Valley, swung on long pedicels from the undersides of the leaves, some in clumps with fine rosy-brown hairs on stalk and calyx, others in a continuous line, every branchlet strung from tip to stem with waxy white bells.

Of wild flowers there was no profusion, due to the generally dry conditions—rainfall being considerably less on the east than on the west side of the Andes. The yellow *Calceolaria* (topa-topa colloquially) was most prevalent, growing singly or in small clumps for the most part but colonizing in hundreds any shady moist south banks. With one, and sometimes two-three heads on tallish stems, and bright golden bags conspicuously inflated, the species we saw was probably *C. polyrhiza*—"an indispensable and indestructible charmer," (FARRER, *The English Rock Garden*). A small yellow creeper we could not identify twined its ropes high up in the trees and perfumed all the air around, with a scent I am told like *Olea fragrans*. The ground was carpeted with a little yellow *Viola*, more in bloom as we went westward, and unlike the alpine flower in having a slightly upward tilt of the head. We were much struck, too, with an herbaceous plant, the botellita (little bottle), which crowded by waterfalls, clinging apparently without substance to the rock face and shaking diminutive crimson bells in the teeth of the spray.

We crossed from the Argentine westward into Chile from Las Freias to Peulla, the pass through the Andes between these frontier points being not more than 3,000 feet high, but steep enough to cause us anxious moments as we hurtled down in the dilapidated omnibus, with doubtful brakes, supplied by the State. We were distracted, however, and the journey made memorable by giving us our first glimpse of wild *Embothrium* in flower, in the woods by the roadside; in the Argentine they were only just beginning to show colour. Having a steamer connection to catch, unfortunately we could not wait to explore these woods above Peulla, but had to push on, across the lovely Lake Totos Los Santos to Petrohue, and the volcanic area beyond. Our hotel for the night on the Petrohue river (where incidentally there is wonderful salmon fishing) occupied a somewhat sinister position at the foot of Mont Osorno, a huge white-capped cone which dominates the landscape, and about 100 years ago erupted, pushing the Petrohue river some miles to southward. The area north of the river and around Ensenada is only just recovering and at the stage of growing small trees. The establishment of plant life on volcanic lavae there apparently follows always the same pattern, first the formation of blue algae, followed by mosses, then in turn the Myrtle, the Radal (*Lomatia obliqua*) and the Coigue.

In the neighbourhood of Petrohue, Ensenada and Puerto Mont, *Guevina avellana* and *Eucryphia cordifolia* appeared for the first time, both in considerable numbers but not yet in flower, *Drimys Winteri* occurred to a lesser extent. The Weinmannias, *Sophora tetraptera* and

a species of tree Myrtle were all in blossom—bush Myrtles (? *M. Lechleriana*) crowded the roadsides, their coppery spring foliage rivaling that of *Photinia serrulata* at home. Shrubs in flower included *Fuchsia magellanica*, the tall *Pernettya* previously described, *Escallonia macrantha*, and *Buddleia globosa*, but we did not see the *Buddleias* flowering profusely or growing rampantly until the approach to Valdivia, where they revelled on dry sandy banks on the east side of the road and looked very handsome en masse. The admixture of *Nothofagus*, *Lomatia* and *Macqui* was much as on the Argentine side, only stunted.

Between Ensenada and Puerto Mont we ran into pure European gorse country in full bloom, more prolific than we had seen it in England and with the cocoanut scent of English Gorse only not so piercingly sweet, I suppose because of the hot sun. We were to have another reminder of home later on, on a river fishing expedition north of Concepcion, where the sand dunes were covered, for miles, with *Rosa canina* bushes laden with flower of the true fragrance of the English Wild Rose. These examples bear out the view held by the late LIONEL DE ROTHSCHILD, and shared by others, that plants native in their land of origin (as opposed to garden hybrids) are generally sufficiently wild looking to blend without offence with the landscape of other countries. They were certainly pointers to the error of the widely followed notion that species native to a locality do better and grow faster than foreign introductions. Except for the *Embothriums*, we saw in Chile no native shrubs or flowers equal in general hold and extent to the Gorse and Roses, or to the *Eschscholtzias* which have become all too freely naturalized in South America and must be the bane of the farmer.

From our first glimpse of them on the Chilian side of the Andean foothills, the *Embothriums* became increasingly conspicuous as we travelled westward, on the mountain sides above Lake Totos Los Santos, springing up out of most inhospitable volcanic rock beach by the Petrohue river, following us to Osorno and even beyond Valdivia on the journey to Temuco, but diminishing as we went northward. Their finest display was on hillside tilted full into the sun on the south side of Lake Llanquihue, where the road is tranché for some distance into rocky cliff, just above the water line, and packed with *Embothrium* on both sides. Below the road their brilliant clusters glowed against the deep blue of the lake; from the cliffs above loaded sprays hung over the road forming a dense half-canopy, and in the open we found them crowding the sun-baked slopes and spurting like flames, high up among the distant rocky crags—all at the peak of their flower, at the end of October. It is difficult to describe such a scene, to those who do not know the *Embothrium* or who know only the scattered single specimens in southern gardens at home. It was as if the waters of an English lake were turned to mediterranean blue, and the slopes above drenched with huge scarlet honeysuckles. In open country, in farm gardens, and on the fringes of the woods, the *Embothriums* grew into trees up to 40 feet high, in shape and density of flower like pear trees in their prime in alpine meadows. (Fig. 182.)

Most of those we saw appeared to be *Embothrium longifolium*, but it was difficult for an amateur to tell, all the freshly opened young leaves

being broad, like *coccineum*, and only the fact that on almost every bush we examined one or two of the old narrower leaves persisted, seemed to indicate that all might lengthen and darken in time and justify the classification as *longifolium*. From their manner of flowering, some branches at the tips, others forming a dense overall sleeve of blossom, or flowering on all but the tips of the new wood, it looked as if the variations might be due to local conditions, the extent to which individual branches were tilted to the sun and the wood ripened, the degree of expenditure of energy on new growth at the expense of flower, or might these have been a massed collection of natural hybrids between *E. coccineum* and *E. longifolium*? Plants exposed to wind did not flower so freely. We saw *E. lanceolatum* only in Valdivia and Temuco, in the former planted as a street tree.

Our opportunities for plant hunting ended at Ensenada, from whence we had to get back by road and train, by the quickest routes, to Santiago, and so homeward by air via Peru and New York. Among other lasting plant memories of the trip were the parting gift from our Austrian friend in Chile of a little bouquet of *Chloraea leontoglossa* (*grandiflora*), a wild Orchid of the Andes, which if you know where to look for it can be found in flower as early as November, when we left—a treasure finely checked all over with dark green on a green-white ground, fragrant like *Iris stylosa* but even sweeter; the Paulownias in flower in the plaza at Concepcion, trees nearly as big as fully grown Horsechestnuts in this country, and again, with *Prunus Pissardii*, and *Ceanothus Veitchianus* forming what may well be an unique planting scheme of a housing estate, in the new residential area of Santiago; the beauty of *Araucaria Bidwillii* in the municipal garden of Vina del Mar, and one's disappointment at finding it is too tender for a Surrey hillside! Jacarandas in bloom in Peru, and a magnificent specimen, 30 feet high of *Spathodea campanulata* (Bignoniaceae) which we found quite by chance in a convent garden at Chosica, 20 miles from Lima, its dark foliage crowned with orange-scarlet flowers like Lilies, a sight against the blue summer sky. We were told that only two *Spathodeas* (introductions from West Africa) are known in the Lima district or for miles around—a refreshing change from the more general habit of adoption of a beautiful new plant to the extent that it becomes almost commonplace. In this connection it is not without interest to imagine some of the effects of accelerated travel in a future atomic age—when a journey between the extremities of the hemispheres may take only a matter of hours. With such facilities for becoming acquainted with trees and shrubs in their natural surroundings will our desire to introduce them as foreigners into our landscape and gardens diminish or increase? Whatever the answer, it is to be expected that much propaganda will be disseminated for the preservation of the individual botanical characters of the countries of the world, not least from the point of view of the traveller, who may well become bored at finding over-repetition of his native vegetation when he explores abroad.

NOTES FROM FELLOWS

The Vegetative Reproduction of Metasequoia glyptostroboides

ABOUT two years ago cuttings of this plant were rooted by MR. KEMP of the Royal Botanic Garden, Edinburgh, and this was repeated in the Royal Horticultural Society's Gardens at Wisley. The cuttings were small and were taken from plants in active growth; cuttings of some genera of Conifers root easily in this way.

On December 19, 1949, I noticed that one of my *Metasequoias* had developed a double leader—the plant, which was about 3 feet high, was growing in a pot in a sheltered position in the open. I cut out the weaker lead, and then decided to try to root some of the side growths of the piece I had cut off. I selected ten suitable growths varying in size from $4\frac{1}{2}$ to $7\frac{1}{2}$ inches and detached these with a heel which I trimmed. I want to emphasize that at this period the plant was absolutely dormant without any leaves. I inserted the cuttings round the edge of a pot of sandy soil, placing the largest cutting in the centre as there was no room for it elsewhere. The pot was then watered and placed in a propagating case in a warm house. There were several other pots of cuttings of other plants in the same case.

After about four weeks it was evident that the buds were swelling and a fortnight later they were showing the green of the young leaves, which soon after were being freely produced on each cutting. These leaves continued to grow, but I did not yet dare to look for root action. Early in March when leaf growth had further increased, I decided to risk it, and turned the soil out of the pot; there was no sign of root action but the cuttings had callused. About the middle of April I turned out the soil again and found that every cutting had rooted. The roots were very delicate, light coloured threads, only about $\frac{1}{2}$ inch to $\frac{3}{4}$ of an inch long. I potted the cuttings up separately in $3\frac{1}{2}$ -inch long pots, discarding one as too weak; I used John Innes pot mixture with a little extra sand, and provided good drainage. The plants suffered no check at all and growth has continued ever since although rather slowly at first. They are now all well established, 15 inches high, including the longest one which was in the centre of the pot, a much less favourable situation for rooting than around the edge. I believe that this is the first time that a cutting of dormant wood of a deciduous Conifer has been known to root; it is not clear to me whether to attribute this to any special factor in *Metasequoia*, or to the neglect of horticulturists in experimenting in this form of propagation. It is for these reasons that I have given the story of the rooting of these cuttings in greater detail than such a result would ordinarily merit.

Late, I tried a side growth 6 inches long, in full foliage, which I had detached with a heel; this was put into the propagating case and had rooted very strongly within a month.

It therefore appears that *Metasequoia glyptostroboides*, which was at one time one of the rarest of plants, will before long become one of the most common, provided that it can be grown in the open in this country. Its seed germinates freely and its vegetative propagation is very simple.

MAJOR ALBERT PAM, O.B.E., M.A., F.L.S., V.H.M.

Myrtus Lechleriana

MR. G. W. ROBINSON, in his article on "Some Chilean Plants cultivated in Britain" on p. 205 of the JOURNAL, says that "*Myrtus Lechleriana* . . . is much like *M. apiculata* but has smaller flowers and the leaves are less sharply pointed. Though I have seen the plant I have not yet grown it, nor do I remember having seen it in Chile."

In case this should lead gardeners in the milder counties to suppose that *Lechleriana* was not worth growing in addition to the familiar *apiculata* (syn. *M. Luma*), may I record my experience of growing both plants in an exposed garden in West Cornwall?

For garden purposes the two plants are very distinct.

One of the principal characteristics of *M. apiculata* is its habit of making a more or less bare trunk, golden-brown with paler flakes. Sometimes one sees it bushy down to the ground, but it generally carries its leaf-mass aloft like a small tree. *M. Lechleriana*, on the other hand, does not, hitherto at any rate, show this tendency. It makes a tall dense bush of erect habit, furnished down to the earth. With me it sometimes layers itself.

Next, there is the marked difference in flowering season. *Lechleriana* produces its lovely show in May, *apiculata* in August-September. *Lechleriana*'s flowers are smaller, but they make up for this by their profusion—though indeed it would be hard to exceed the floweriness of *M. apiculata* at its best. The flowers are quite different in colour and in general effect, being cream-white instead of paper-white and fuzzy in effect like a *Spiraea*'s, flushing into coral-red when petals and stamens fall and leave the five-pointed calyx exposed. The flowers have five petals, not four as is usual in *apiculata*. The scent is different, very pleasant and often widely diffused. After the flowering the shining young shoots colour the whole bush golden-copper so that it then competes in foliage with such shrubs as *Vaccinium ovatum*. The berries turn as black as *apiculata*'s do, but are scarlet at first—a detail not noticed in the account in the *Botanical Magazine*.

Surprisingly, this proves to be an exceptionally wind-resistant shrub, even in the abnormally severe conditions to which it is exposed here. MR. G. H. JOHNSTONE, whose exhibit of this plant won an Award of Merit, tells me that "as a clipped hedge I think *M. Lechleriana* comes out about the top." But it is not one for the colder counties. Here it came through the 1947 winter virtually unscathed, when common Gorse was all killed to the ground; but MR. MARCHANT tells me that it is not hardy enough for Dorset, and even in Cornwall its precocious flower-buds may be destroyed by severe Spring frosts.

Fig. 193 shows a bush of *M. Lechleriana* in flower in Cornwall.

Zennor St. Ives, Cornwall.

W. ARNOLD-FORSTER

Hippeastrum × *gracilis*

The history of the large flowering *Hippeastrums* is well known. They all originated from the species *vittatum*, *reginae*, *Johnsonii*, *crocatum*, *fulgidum*, *paradinum*, etc. It is also known that a Lancashire watch-maker, named JOHNSON, raised the first hybrid in the year 1799, by

crossing *H. vittatum* \times *H. reginae*. Other hybridists followed with remarkable crossings. The main purpose was to raise flowers with six petals of the same size and nearly circular-formed flowers. Later the hybridists aimed at the disappearance of the hard green centre and at the production of new colours, especially white. We know the result of hybridizing and selecting.

The flowers of the modern Hippeastrums are large, sometimes 12 inches diameter and therefore only suitable for large rooms and vases. This was a handicap for MR. H. BOEGSCHOTEN, private head gardener of MR. C. J. BUNGE, one of Holland's leading industrialists and merchants, whose love for beautiful flowers and gardens was great. MR. BOEGSCHOTEN was once asked by MR. BUNGE to make a table decoration of Hippeastrums and used for this *H. reticulatum* var. *striatum* of which he was growing a rather large quantity. MR. BUNGE and his guests, especially the ladies, were astonished at the lovely small flowers; only the colour needed to be more attractive, e.g. red. This chance remark stimulated the head gardener to try to raise small flowering Hippeastrums with an outstanding red colour. He bought *H. rutilum*, a species imported from South Brazil. Its flowers are elegantly shaped, carmine-red and the stems strong, but not too thick. MR. BOEGSCHOTEN made the following crosses *H. rutilum* \times *H. hybride* and *H. hybride* \times *H. rutilum*. The first hybrids from *rutilum* \times *hybride* were small and of red colour. The other cross gave too thick stems to the small flowers. After many years of hybridization and selection a fine red colour was obtained without green in the centre. To perfect the thin stems and the graceful small flowers, the progeny of *H. rutilum* \times *H. hybride* have been crossed again with *H. rutilum*. The result of it was surprising and gave the most beautiful formed small flowers with bright red colour and elegant thin stems. This race is very free flowering, so that each bulb carrying three stems each with four to six beautiful flowers is no exception. The height of the thin, but strong stems is 14 to 20 inches and the flowers are very suitable for filling small vases and for table decoration.

G. C. V. MEEUWEN, LTD., purchased the whole stock and showed *H. rutilum* \times *H. hybride* \times *H. rutilum* at the weekly meetings at Haarlem under the name of *H. gracilis* and received a first class certificate for this beautiful strain.

The results of *H. hybride* \times *H. rutilum* are called *H. rutrum*, but have too thick stems and in our opinion they will disappear again.

J. F. CH. DIX

The Cultivation of Jeffersonia diphylla

This species, popularly called "twin-leaf," because each leaf-stalk bears at the top what looks like two leaves, but which are in reality one leaf completely divided into two leaflets, is easily grown, but with me does so much better in pots than in the open that a note seems worth while. I have the plants in both locations. In a recent article by MR. A. EVANS (R.H.S. JOURNAL 75, p. 151) mention is made of them growing in a peat garden in the Royal Botanic Garden, Edinburgh. No doubt good success can be obtained in the open provided the right site is

available, but for many people, as it certainly is with me, this is impossible. The plant is found in nature in rich soil, usually on wooded (deciduous) slopes, and seems to be confined to the U.S.A., mainly east of the Mississippi River. Considering the habitat proper cultivation is readily ascertained. I have measured in the open a plant which had a height of $6\frac{1}{2}$ inches, and a leaf-width of $2\frac{1}{4}$ inches. In a 4-inch pot (which seems ample for one plant), the height was 11 inches, with a leaf-width of 3 inches. The solitary, erect flowers, appearing in early spring, and shedding their petals very soon, are also larger in pots.

The leaves remain green for a long time, and the plant is striking enough, I think, to deserve frequent cultivation. Not only are the leaves odd and beautiful, but the seed-pod is also unusual, opening when ripe by a lid at the top, the rather bony seeds escaping through the aperture. Seeds are produced by self-fertilization, and they grow readily, although flowers cannot be expected for several years. However, this species is more valuable as a foliage plant.

Freezing should be avoided on account of possible injury to the pots. However, artificial heat should not be given.

Gary, Indiana, U.S.A.

EDWIN D. HULL

Euonymus pendulus

It was about a hundred years ago (1850) that *Euonymus pendulus* was introduced into this country. It was formerly distributed to gardens under the name of *E. fimbriatus*, and is still sometimes found so labelled. But this is a different species and deciduous, while *E. pendulus* is evergreen.

E. pendulus owes its name to NATHANAEL WALLICH, the well-known Superintendent of the Botanic Garden at Calcutta. He was a friend of the great Missionary, DR. WILLIAM CAREY, who was himself deeply interested in Botany. In 1824 DR. CAREY printed at his Mission Press: "*Flora indica*, W. ROXBURGH, ed. W. CAREY, D.D., F.L.S., to which are added descriptions of plants more recently discovered by NATHANAEL WALLICH." I looked up the faded old volume in the Lindley Library, and read at the bottom of the title page "All thy works praise thee, O Lord."

The great attraction of *E. pendulus* is the rich shining red of the young leaves in Spring, rather similar to that of *Pieris Forrestii*, but the red lasts considerably longer. It should be better known. MR. MARCHANT has told me of fine specimens 25 feet high; and I have recently seen the tree at Tregrehan which the late Mr. Bean described in 1916 as "a small tree of shapely pyramidal form 20 feet high, its trunk 4 feet in circumference." It has been very beautiful this Spring at Caerhays and Tregothnan.

J. W. HUNKIN
Bishop of Truro

Iris susiana

Iris susiana has now been growing in my garden at Malton for three years and flowered this year for the first time. It appears to be quite safely established at the top of a retaining wall, backed by a Lavender

hedge which absorbs surplus moisture. It is growing in a shallow bed of loam with limestone brash about 12 inches below the surface of the soil, facing due south.

Under the same conditions I am growing all the *Regelia* group, and a large variety of *Regelio-cyclus* hybrids which flower as freely as any border *Iris*. Neither they nor *I. susiana* are given any protection of any sort, and they do so well that I am experimenting this year with *I. Lortetii*, *I. Bismarckiana* and *I. atrofusca*.

Malton, Yorkshire.

C. H. GREY

HORTICULTURE IN SINGAPORE

R. E. Holttum

(DIRECTOR, BOTANIC GARDENS, SINGAPORE, 1925-1949)

THE visitor to Singapore cannot fail to be impressed by the bright display of flowers in the Chinese nurseries on the outskirts of the city. Judged by standards of drier or more seasonal climates, our flowers, apart from Orchids, may not be of outstanding quality, but they are the same throughout the year. They represent a considerable triumph over climatic difficulties, as any newcomer will realize who tries to grow them by methods which are satisfactory elsewhere. The fact is that local Chinese gardeners have adapted their methods in a remarkable way to our climate, and have adapted them also to a considerable range of different plants. The most interesting and remarkable development of this kind is the variety of new Orchids which have been produced in recent years. A very fine display of these Orchids, including nearly one hundred different species and hybrids, was shown at the recent Singapore Flower Show.

One might think that the perpetual summer of Singapore would provide a gardener's paradise, but this is far from the case. Our days are always short, so that those summer-flowering annuals of northern latitudes which need long days will not flower. Autumn plants, such as Michaelmas Daisies and Dahlias, flower at all times of the year, but precociously, and the plants need special care to grow them to a good size; and our minimum night temperature (never below 70 degrees) is too high for them. Flowering shrubs and trees of the drier regions of the tropics and subtropics, when they can adapt themselves to our continuously wet climate, often grow continuously without flowering, or flower rarely. The wet equatorial regions have produced few good ornamental garden plants apart from Orchids. Add to these troubles a heavy clay soil, the difficult qualities of which are exaggerated by our constant high temperature and humidity, and it will be seen that the gardener in Singapore has many difficulties to contend with.

The kinds of flowering plants that will tolerate our climate have been gradually discovered by many trials. Nearly all of them are imported, and nearly all flower less well here than in their proper climates. Among the most successful are Cannas, which will flower finely if they are generously treated. But Hydrangeas, which flower so freely and

beautifully with little attention in a suitable climate, can only be brought to perfection with constant care and intensive manuring in Singapore. Gladioli, which can be made to flower at any time of year, though very beautiful, are smaller and shorter-lived than in a cooler and drier climate. Dahlias and some other crimson or purple flowers lack the richness of colour which they will develop in cooler climates (as at the hill stations of Malaya).

But with all these and many other disadvantages (such as the prevalence of some insect pests) we have one advantage, and that is our perpetual summer, which gives us flowers (the same flowers) right through the year, with only a slight reduction in the wetter more overcast months of October to January, and something of an improvement as a result of the drier weather that usually comes in January or February.

Two styles of gardening have met in Singapore, and have mutually influenced each other: the British idea of a garden of lawns with flower beds, flowering shrubs and trees, and the Chinese idea of a garden of potted plants. By the use of plenty of compost, combined (in the case of our clay soils) with deep digging, a limited number of bedding plants and flowering shrubs can be maintained satisfactorily. But there are some other plants, particularly "annuals" (a term which loses its significance here) which need very well aerated soil for their best development, and these are grown by Chinese gardeners as pot plants. And other plants also, which grow well enough in the open ground, are also often grown in pots because they can thus be made to produce more flowers, by judicious restriction of watering.

The Chinese gardeners have developed a special method of preparing their potting soil, which seems to be peculiar to Malaya. They take large pieces of clay and pile them on top of some old logs of wood and other rubbish, in such a way that the wood will burn slowly over several days and thoroughly bake the clay. The resulting material will absorb water without becoming sticky or sodden, and if used as a potting soil will remain well aerated though subject to torrential rain. The Chinese gardeners usually mix a proportion of organic matter with the burnt earth, but for plants which are very sensitive to wet conditions the burnt earth may be used alone, the dust being removed from it by sieving.

The use of a burnt earth mixture ensures a well-aerated rooting medium, but it does not provide much plant food. The latter is given a little at a time in liquid form, every few days. Organic manures of various kinds are used, and are rotted in water, the diluted liquid being applied (the resultant odours are of no consequence!). This intensive manuring ensures vigorous growth, and without such manuring it is hardly possible to grow good plants of the common annuals like Zinnias, Asters and African Marigolds, nor of Hydrangeas and Chrysanthemums.

The Chinese gardeners have applied their intensive manuring to other plants also, notably to Orchids, with astonishing results. Hydrangeas and Chrysanthemums are obviously not at home here, and even with all our skill and care they are second best; but our local Orchids are well adapted to the climate, and, when correctly sited and intensively manured, a few of them produce astonishing results in growth and flowering.

For many years the only free-flowering Orchid in Singapore was *Vanda* 'Miss Joaquim.' This hybrid was named in 1893, and has long been the most abundantly cultivated Orchid here. It is easily propagated, easy to cultivate, and needs full sun. The more strongly it grows, the better it flowers, and a well-managed bed of plants will be continuously covered with flowers. This hybrid showed what was possible in our uniform climate. If a plant is adapted to grow and flower continuously, our climate gives it maximum scope, when combined with methods of intensive manuring. In recent years a considerable number of new hybrid Orchids have been raised at the Botanic Gardens, Singapore, with the object of producing a greater variety of really free-flowering plants. Several hybrids between species of the genera *Vanda*, *Arachnis* (scorpion Orchids) and *Renanthera* (red scorpion) have now been proved to be really free flowering (Fig. 192). The most successful is *Arachnis* 'Maggie Oei,' which produces sprays of flowers two to three feet long, quite continuously. The flowers are very like one of the local wild scorpion Orchids, but none of the latter are perpetual flowering, and so are not useful as garden plants.

The hybrids of *Arachnis* and *Vanda* are particularly useful because they are so easy to propagate and to grow in any garden which is exposed to full sunlight. Attention has also been paid to some other Orchids of different habit, which must be grown in pots or baskets and are much less easy to propagate. Among the best of such Orchids for local cultivation are hybrids of a group of species of *Dendrobium* (section *Ceratobium*) native of the New Guinea region. These have long sprays of graceful and rather fragile-looking flowers which are yet very long-lasting. The hybrids of these Orchids prove in many cases more free flowering than their parents, and a number of them have now been produced. They need careful management, but Chinese and other local growers have managed to apply to them also the methods of intensive manuring, and have produced plants of remarkable size. *Dendrobiums* are not continuous in growth like *Vandas*, but make a succession of new shoots from the base of the plant. The best *Dendrobiums* flower on each new shoot as soon as it is fully developed, and also on the same shoot later. The best also do not have too long a rest between one new growth and the next. In our climate growth is possible at all times, and the plants that rest least are the most efficient.

Cattleyas, which are generally acknowledged to be the finest of all Orchids (as certainly they are the largest) are somewhat less well suited to Singapore than the New Guinea *Dendrobiums*, as some of them will not tolerate our lack of dry weather. Most *Cattleyas* can, however, be grown if suitably potted and protected from rain in our wetter weather, and a few are very successful. Again, those that need least rest, and will make new growth as soon as possible after the last shoot is mature, are the best. Some of these will flower regularly twice a year, or even more often. The methods of intensive manuring may be applied to *Cattleyas* as well as to *Dendrobiums*.

Because of their unusual form and long-lasting characters, Orchids are especially popular as cut flowers, and if exploited to the full they could be produced in far greater variety than any other class of flower

in Singapore. But there is no reason why other classes of flowers should not also be bred and selected in Singapore with the object of producing perpetual-flowering varieties which are suited to our climate. The skill of the Chinese gardeners has shown what can be done to exploit our climate to the full; what is needed is a more varied selection of plants to which intensive methods can be applied.

The methods of the Chinese gardeners also would repay scientific investigation. A plan is now in hand for such an investigation of Malayan Chinese fish-pond methods, which produce a far greater yield of fish than any method in any other part of the world. I believe a similar investigation of horticultural methods would be of great interest, and might indicate further possible developments. Chinese vegetable growers in Singapore can produce a crop of green vegetables in a month, and then prepare the ground for another crop; ten crops in a year are possible. I do not think that hydroponic experts could produce much greater yields in the same time and area, though they could doubtless effect an economy of human labour. Again, modern methods of plant breeding could probably give the Chinese vegetable grower more varied and better subjects for his skill. It is time we made a better use of the unique climatic conditions of Singapore.

BOOK NOTES

"Trees and Shrubs hardy in the British Isles." By W. J. Bean, C.V.O., I.S.O., V.M.H., Ed. VII, Vol. 1, A-E. pp. 703. 8vo. (John Murray.) 42s.

When in 1914 the first edition of this fine work appeared in 2 volumes it was eagerly welcomed by all who valued trees and shrubs for the outdoor gardens. It became their indispensable companion and a sure and certain guide as to the use and possibilities of many beautiful things. In 1933 a third volume was added containing descriptions of new acquisitions and notes on their behaviour and including plants better accommodated in the milder parts of the country which had been omitted from the earlier volumes.

This new edition will be even more welcome for it brings the contents of all three volumes together in their alphabetical position making it easier to consult, adds a few new plants as well as notes to those already included, corrects a few—fortunately very few—names, for Mr. Bean was averse from altering old names wherever it was possible to retain them, and provides a full index to all plants named in the work. There are also a number of additional plates of outstanding plants.

The remaining two volumes are due to appear towards the end of 1950.

"The Art of Botanical Illustration." By Wilfrid Blunt, with the assistance of W. T. Stearn. Pp. xxxi, 304. 47 col. plates, 32 monotone plates, 75 text figs. (The New Naturalist, 14, Collins.) 21s.

This was a much needed book. Mr. Blunt has blazed a trail through the great forest of botanical illustration, the remoter areas of which lie almost beyond the ken of the ordinary student. Of course much has been written, in one way or another, about botanical art, as the bibliography at the end of this book shows. But so far no general guide book had appeared which dealt with the subject consecutively and as a whole. The great herbals and folios of other centuries lie mostly in our University, Museum, or specialist Libraries, or in great private Libraries like that of H.M. the King at Windsor. And therefore it is rather difficult, except for the fortunate few whose working days are spent in such Libraries, to become familiar with them, or even to find out exactly what exists.

Mr. Blunt brings to his task the knowledge of a specialist, the judgment that comes of wide culture, and the seeing eye of one who is an artist himself. In botanical matters he has had the highly expert assistance of Mr. W. T. Stearn, and also in bibliography.

The book is therefore an authoritative guide to botanical art in all its aspects. It deals of course practically entirely with European art and no 300 pages could contain more condensed or useful information regarding all the chief personalities in this field and even many of the less-known. Moreover, the bare facts are enlivened by Mr. Blunt's critical comments on the artists' work in itself. The nineteenth and twentieth centuries seem somewhat telescoped, but could hardly receive more detailed treatment in a book of limited length. The half-dozen pages devoted to oriental art will serve at least to remind readers of the existence of this great branch of floral illustration. And the references to American artists of the nineteenth and twentieth centuries are particularly welcome, as giving information which is in the ordinary way difficult to come by. An interesting Appendix is the reprint of eight articles on Botanical Drawing by W. H. Fitch, published in the *Gardeners' Chronicle* in 1869.

The book is amply illustrated, the figures excellent and the monotonous for the most part satisfactory. But the colour plates are disappointing. In colour plates one knows one can only get a kind of translation—something that is not quite the real thing—and one allows for this beforehand. Great variation in the truthfulness of reproduction is possible according to the technique adopted in printing; but quite a number of these plates simply cannot stand comparison with their originals. No doubt considerations of price prevented a higher level and one appreciates all the same the wide range of the illustrations, and the care shown in their choice.

With the above reservation the book can be whole-heartedly recommended to all those lovers of flowers, pictures and books to whom Lord Aberconway referred in a similar connection not long ago.

F. CARDEW

"Lilies of the World." By H. Drysdale Woodcock and William T. Stearn. 431 pp. Illus. (Country Life Ltd.) 35s.

The authors originally intended this book to be a third edition of *Lilies: their culture and management* published in 1935 but it was found that so much had to be omitted and a great deal added, thus essentially producing a new book, that they decided to publish it under the above title. The book under review is indeed a much larger work than the Woodcock and Coutts *Lilies*, the pages being royal octavo and almost double in number.

The collecting of 136 photographs and line drawings must have entailed a vast amount of research. To the many who are familiar with the lovely group of Giant Lilies at Townhill Park (p. 355) the frontispiece should be of special interest, for it shows that species growing in the wild. Another photograph taken in Assam shows *L. Wallichianum* and this should stimulate us to make renewed efforts with this somewhat temperamental Lily.

Several species such as *L. Vollmeri*, *L. ponticum* and *L. Fargesii* are figured for the first time, other little known Lilies such as *L. amoenum*, *sempervivoides*, *papilliferum* and *Stewartianum* are also portrayed.

Fig. 32, a beautiful drawing, is of added interest in that it was executed by the French artist Claude Aubriet (circa 1700). It was after him that Aubrieta was named. A specially drawn map of China and adjacent regions will prove of interest to those who like to know the country of origin of the many Lilies which have been collected in those parts.

Part I which consists of ten chapters, beginning with an introduction, deals with form and function, climate, position and soils, easy and difficult Lilies, their place in the garden and general cultivation. The growing of Lilies in pots in the greenhouse is well described, also hybridisation and propagation. Finally, pests and diseases. Much of the foregoing covers familiar ground as might well be expected, but all will be useful to the beginner.

Under propagation one misses a few helpful photographs from the old book, but epigeal and hypogeal germination are described and illustrated.

Chromosomes and their behaviour are mentioned somewhat sketchily, the diploid form of *L. tigrinum* is also mentioned, a Lily which may be useful to the hybridisers who wish for still more orange crosses, but one which for garden purposes is definitely inferior.

Chapter 10 deals with diseases and pests. With the numerous insecticides at our disposal, the latter are fairly easily dealt with, but it is surprising that the authors make no mention of H.F.T.P. (Hexethyl-tetraphosphate). More than one preventive is recommended for Botrytis but in the end we are advised not to grow *L. candidum*. If this is good advice, why not include *L. chalderonicum* and \times *testaceum*? Further, some noteworthy plant pathologists tell us that the disease which disfigures the Lilies of this group is not always Botrytis, so where are we? More stress should have been laid on the protection of these susceptible Lilies from the combined effect of sun, rain and wind, a practice which gives better results than any of the advertised sprays and dusts.

The term Mosaic and Virus are used somewhat loosely which might convey the impression that they are synonymous. In the treatment of Fusarium basal rot no mention is made of the American Arasan, nor of the British product Aratan (Bayer) both of which contain mercurial salts.

Would that Lilies were as amenable to treatment as are the higher animals!

The first chapter of Part II deals with the Classification of *Lilium* and allied genera, the former being still divided into Leucolirion, Archelirion, Pseudolirion and Martagon; the other genera are Nomocharis, Notholirion, Korolkowia and Cardiocrinum. Some of us will find it difficult to relinquish the old name for the Giant Lily but it is impossible to find outside this group of four species included in Cardiocrinum any true Lily with such broad basal leaves (actually prolongations of the older scales), or which makes no attempt by immature bulbs to throw up a stem of any sort until it is ready to bloom and in which finally the main bulb dies after flowering (monocarpism). Finally the segments of the seed capsule are markedly toothed and unlike any Lily fruit.

It may well be said that the taxonomists have here a good case which gardeners can hardly argue over, but it will be some time before we all speak of *Cardiocrinum giganteum*.

Less easy to accept are certain other changes made in deference to the International Rules of Botanical Nomenclature, thus: the *L. elegans-Thunbergianum* group becomes *L. maculatum*; the umbellatums are put under *L. hollandicum* and worst of all *L. × princeps* becomes *L. × imperiale* and *L. ochraceum* must be called *L. primulinum*. It is comforting, however, to find an erratum slip on p. 5 or 285 to the effect that Baker's name for the sulphur Lily has two months' priority over *L. myriophyllum* of Franchet so we now revert to the much pleasanter and sensible name of *L. sulphureum*.

The old confusion surrounding the group of Lilies under the name of *L. Brownii* becomes worse confounded, at any rate, to the mere gardener. Naturally the old discarded names no longer occur in the body of the book, but the very complete index provides an easy method of finding them. For instance, if one looks up *L. elegans* and *L. umbellatum* one finds the page numbers 263 and 288 which give the details of *L. maculatum* and *L. hollandicum* respectively. Chapter 14 in the course of 230 pages gives a very complete list and description together with the history, bibliography and synonyms of practically every known species, variant and hybrid *Lilium*.

Chapter 15 deals with the Cardiocrinums, Notholirions and Korolkowia, but Nomocharis is included in a separate appendix.

Further appendices are concerned with Latin diagnoses to safeguard certain new names, sub-division of the Genus *Lilium* into 15 groups, a very complete bibliography of old Lily literature, advice is also given on storage and packing. The last appendix, a glossary of technical terms would appear almost redundant. On the other hand, no mention is made of A. Simmonds' list of Hybrids (L.Y.B. 1939, pp. 40-51) nor of F. Comber's proposed Classification of *Lilium*.

As already indicated the index is very complete and difficult to fault.

This authoritative work is already in the hands of many Lily growers and rightly so. It contains a vast store of valuable information in a comparatively small book. If Woodcock and Coutts' 1935 book was called the Lily grower's Bible, what name shall we give to its successor?

MAURICE AMSLER

"Fun with Flowers." By Julia Clements. 144 pp. 115 Illus. (My Garden Publications.) 21s.

The authoress of this book has evidently been born and blessed with good taste, plenty of ideas and mental energy. Anyone who takes pains and interest in setting up flower arrangements would find this volume a great help and an inspiration as it thoroughly treats of the materials that may be used and also gives instructions and hints of what to avoid. The photographic illustrations are very good and so varied that anybody's particular taste can be stimulated and helped by them. A few of the arrangements seem to be a little crowded and the instructive pages 54 and 55 showing the different stages in the making, rather indicate that stopping at No. 2 or No. 3 would have completed a better result. Figure on page 104 shows this desirable restraint. It is to be regretted that some of these arrangements show some of the flowers which have naturally rigid stalks and habits so set that they are hanging down almost over the edge of the container. Irises, Gladioli and Narcissi are surely better put up in their more natural position, letting foliage or suitable flowers form the necessary horizontal lines. The note under illustration No. 96 mentions "A Japonica" (*i.e.* A Japanese)—there is no such thing as "A Japanese"—the particular plant used here seems to have been Mahonia, sometimes called Berberis.

It is to be hoped that this book will encourage many readers to improve their taste in flower arrangement and it will certainly give them an enjoyable insight into the diverse forms and characters of the materials used for the purpose—and they will get "FUN" out of it too.

F. GALSWORTHY

"The Cactus Grower's Guide." By Vera Higgins. New Gardening Series. General Editor: Roy Hay. Sm. 8vo. 120 pp. Frontispiece and 10 line drawings. (Latimer House). 7s. 6d.

Mrs. Higgins has already done much to help newcomers to the study of succulents, and this, her fourth book on the subject, maintains the high standard of the others. It is attractively produced, easy to read, and its authenticity is assured by many years of practical cultivation and study of the plants. All aspects of succulent collecting are touched upon, though I feel the beginner may sometimes be left in need of a fuller explanation, or sketch to elucidate some detail of structure or of cultivation technique.

Two chapters on "other succulents" make their appearance after the sections on Cacti. I do not like this rather disparaging treatment of what form, after all, often the greater part of the beginner's "Cactus" collection. It would have been better to limit the book to the subject of its title, or to take the bolder course and end the popular misconception of "Cacti and succulents" by treating all families of succulents (Cactaceae included) on an equal basis.

The cultivation chapters are admirable but could be more explicit in details—insecticides, for example—and surely sand is now outclassed by Vermiculite as a rooting medium?

There is an index of Latin names: a bibliography and short glossary would have been additional aids to beginners.

Mrs. Higgins is a botanical artist of the front rank, as well as one of our leading authorities on succulents—Crassulaceae in particular. It is to be hoped that her next undertaking will be for the specialist and more advanced grower: would a much-needed revision of the *Crassula* group be too much to request?

GORDON D. ROWLEY

"I. V. Michurin: Selected Works." 496 pp. 200 Illus. (Foreign Languages Publishing House, Moscow, 1949, Distributed by Collet's, 67 Gt. Russell Street, London, W.C. 1.) 15s.

Those who have read Academician Lysenko's *Soviet Biology* or the verbatim *Report of the Moscow Conference on Genetics* (1948) will be familiar with the name of Michurin, as throughout these books the so-called progressive Soviet Michurian genetics is continually contrasted with reactionary Mendel-Morganism to the great discredit of Mendelian genetics. But although Lysenko himself and most of the contributors to the 1948 Moscow Conference claim to be ardent Michurinists nowhere in the above books are we clearly told just what Michurian genetics is. It is therefore of interest to read this book of Michurin's *Selected Works*, since his theories, which now appear to be the basis of plant breeding in Russia, have been so much quoted and praised by the Michurinists in recent years.

The book is profusely illustrated. The first illustration on page 4, the twenty-first on page 87, and also the last, number 200 on page 468, are all entitled "New Texas Raspberries." These attractive illustrations bring to mind inquiries I have received in recent years about new raspberries raised and grown in Russia with fruits over two inches long. On page 423, however, we are told that the New Texas Raspberry was obtained by selection from seedlings of the loganberry. Hence the impressive fruits illustrated are not magnificent new raspberries but ordinary loganberries which have been known for nearly 70 years.

Michurin discusses at great length the involved question of the juvenile period of growth of fruit trees, grafting effects, and the influence of the stock upon the scion; he also gives an account of the origin of the so-called vegetative Apple-Pear hybrid 'Reinette Bergamotte.' The Lysenko School have made much of this alleged hybrid and claim it to be a classic example of so-called vegetative hybridization. Michurin tells us that he obtained 'Reinette Bergamotte' from grafting an apple on to a Pear stock and says the growth of the Pear stock "became quite sickly in the spring of the second year after grafting" so to save the apple graft he layered and rooted it. In 1898 when five years old, the young layered tree bore its first fruits and Michurin says there was "great deviation in shape and size of the fruits beginning with the 1898 harvest and up to 1906." The first yield in 1898 had the appearance and shape of pears. Finally Michurin says "The seeds of the first fruits were round and large but did not germinate. In the following years the fruits changed somewhat, approximating the usual shape of apples." There is a drawing of the fruit of 'Reinette Bergamotte'; it is not very pear-like. I have seen apples very much more pear-shaped which have had nothing to do with grafting Apples on to Pears, and I cannot accept this as an example of vegetative hybridisation nor can I find anything in the book which proves that there is such a thing as vegetative hybridization.

Michurin's discussions of his so-called "Mentors," and of the effects of environment are prolonged, and seem to be largely, if not entirely, bound up with the juvenile period of growth, especially of fruit trees. In these accounts there is much which those

acquainted with the growing, breeding, and grafting of plants and trees will not be able to agree.

Discussion on the inheritance of acquired characters is mainly philosophical and, as in the case of so-called vegetative hybridization, there is nothing in the book which proves that acquired characters are inherited.

There are, however, some accounts in this book which most biologists, at least most of those outside Russia, can accept. With such crops as Rye, Wheat, Oats, Peas, Millet, etc., Michurin says, "I consider the phenomenon of segregation of the parent types to be quite possible and that the Mendelian laws are applicable here in many details," and although he criticizes the application of Mendel's laws in relation to the breeding of fruit trees, he nevertheless says, "I by no means deny the merits of the Mendelian law. On the contrary I merely insist on the need to introduce amendment and addenda into it, for it is evident to everybody that his calculations are not applicable to cultivated varieties of fruiters [*sic*], for when crossing separate varieties of them, the structure of the hybrids is not due to the hereditary transmission of the direct and immediate progenitors, but in most cases of those belonging to the ancestors of the parent plants, unknown to the originator." This is an addendum which Mendel himself would certainly not have felt inclined to disagree.

Michurin further states, "When investigating the application of Mendel's law to the hybridization of cultivated varieties of fruit plants, I recommend that, as a beginning, the investigation be confined to observing the hereditary transmission of one or two characters, just as Mendel himself did in his work with Peas." Michurin then lists suitable characters for this purpose and then states, "Here there is great scope for applying the whole Mendelian calculus to the entire complex of characters of each hybrid." Actually much has been done in this and other countries, in the genetical analysis of fruits, just as Michurin has outlined.

Michurin says "it is possible to improve our hardy local varieties by crossing them with foreign ones that had been raised in a warmer climate and which yield fruit of better quality as compared with our own. It is indeed refreshing, in a post-war Russian publication to find a tribute paid to the qualities of varieties of fruits raised in other lands.

After reading this book and fully allowing for Michurin's criticisms of early Mendelism one is bound to ask whether Lysenko and his colleagues have been really honest with Michurin. They claim to be disciples of Michurin but their recent violent and wholesale condemnation of Mendelism and Morganism does not seem entirely to fit with Michurin's teaching.

M. B. CRANE

X "Soviet Genetics and World Science." By Julian Huxley. Cr. 8vo. (Chatto and Windus.) 8s. 6d.

This interesting book deals primarily with a discussion of the "Lysenko" controversy. Dr. Huxley describes the Lysenko theories and results as far as they can be ascertained, and after contrasting them with the presently accepted basis of neo-Mendelism and genetics, he is able to show most convincingly that the most disputed theory of the inheritance of acquired characters does not necessarily or even probably result from Lysenko's experiments and that there is little or nothing in them to alter the basis of genetics as generally understood in Western Europe and America.

But very much more important, Dr. Huxley states as emphatically as he can the absolute necessity for freedom of speech and discussion in Scientific matters and shows how this has been lost in modern Russia, how the opponents of the theories of Michurin and Lysenko have been liquidated and disgraced and how a supposed interest on party and ideological grounds has led the Communist Party and the Russian Academy of Sciences to lend their authority to what amounts to the suppression of discussion in an entire branch of science. It is a return to mediaevalism unparalleled, except in some of the excesses of Nazi Germany, for centuries past.

This is an important book and should be widely read. It is as clearly and simply stated as matters of this complexity can be.

P. M. SYNGE

"Fruit for Small Gardens." By D. S. Crowther. 152 pp Illus. (W. H. & L. Collingridge, Ltd.) 6s. net.

This handy book on fruit sets out to show how the owner of a small garden can grow with success not only soft fruits but also fruits such as Apples and Pears, which at one time it was considered only possible to grow satisfactorily in variety under conditions appertaining to large establishments.

After a useful glossary the book starts off with a chapter referring to the research work on root-stocks; the possibilities of growing certain tree fruits in a small garden

are examined and the best means to adopt for so doing are discussed. Then there is a chapter on when and how to plant; factors influencing a possible choice of site are mentioned. Different systems of pruning are described under "the fundamentals of pruning and feeding," followed by separate chapters on "dwarf bushes, pyramids and pillars," "bush trees" and "forms needing a horizontal support."

Cultural details relating to specific fruits are dealt with in the latter half of the book. The Apple and the Pear are given a chapter each and another is devoted to the stone fruits. The soft fruits are dealt with altogether in one—rather short—chapter. We should like to have seen this expanded somewhat and considerably more emphasis placed on the very distinct type of pruning necessary for Black and Red Currants—a stumbling block to so many novices. The book concludes with very complete notes—for a book of this sort—on the enemies of fruit and their control; appended are useful spraying programmes, in which the materials are shown in small quantities handy for the small grower.

There are some excellent line drawings in explanation of the text. The photographic illustrations are numerous; they nearly all have a story to tell and add much to the interest. In a few cases the captions might be slightly amplified—or amended—with advantage; for instance that relating to big bud mite is not borne out by the illustration.

Many growers will fail to agree with all the statements in this book—*tot homines, tot sententiae*—but Miss Crowther has evidently kept her eyes and ears open, for there are many useful titbits of information which readers, particularly those for whom the book is primarily written, should find of value. The area of the garden envisaged by the title of the book is sometimes lost sight of in the author's enthusiasm for the subject.

The subject is of course a wide one, somewhat difficult to compress in the pages available, and the book could readily have been extended into one twice the size; it does, however, put before the owner of a small garden, in succinct form, various methods to be adopted in the culture of many different kinds of fruit.

HOWARD H. CRANE

"Fungi and Plant Disease." By R. B. Mundkur. (Macmillan & Co.) 16s. net.

In the preface to this book the author tells us that despite the considerable advances made in agricultural education in India during the last forty-five years, there is still a great lack of textbooks in almost every branch of this great subject and students have had to rely on European and American publications which obviously have not been ideal for the Indian student. Dr. Mundkur has therefore written this book on Plant Disease in an endeavour to fill a real need in the education of agricultural students in his country. We must say at the outset that in our opinion he has succeeded in his endeavour.

The book contains twelve chapters, the first five of which deal with morphology and reproduction of fungi, their habits and life processes, the kind of symptoms resulting from diseases caused by them in plants, the methods employed in studying such diseases, and the classification of the various fungi concerned. The next five chapters take each group of fungi in turn and contain descriptions and control methods for the diseases they cause; numbering in all nearly fifty diseases important in Indian agriculture and horticulture. Chapter 10 is on Virus diseases and Chapter 11 discusses plant disease control in general as well as describing the use and preparation of various sprays, seed disinfectants etc. There are references to further literature at the end of each chapter and there is a good general index. We must make special mention of the excellent illustrations of which there are no less than 130 in this book of 250 pages.

Only a few of the diseases given will be known to most plant pathologists in this country, but none the less they will approve the way in which the author has presented the subject as a whole. Those students in India who wish to gain knowledge about plant diseases are fortunate in having the aid of this textbook and we congratulate the author on having produced it. The fact that books of this kind are nowadays being written in India promises well for the future development of her agricultural economy in general.

D. E. GREEN

"A Fuchsia Survey." By W. P. Wood. 170 pp. Illus. (Williams & Norgate, Ltd.) 9s. 6d.

The book has filled a long-needed gap, as it is the only book which has ever been published dealing with the history of Fuchsias—description of species and varieties together with their cultivation—since Porcher published the fourth edition of his *La Fuchsia, son Histoire et sa Culture* in 1874.

In the book under review the history of the *Fuchsia* commences 1703, and continues onwards, leading up to the introduction of *Fuchsia* species into Europe in circa 1786, which was ultimately followed by the first recorded hybridizing in 1825. Accounts are given of hybridizers and their raisings up to the present day, including such raisers as Mr. Raffil of Kew, and the Victor Reiters of America.

Gardeners in America will be particularly interested in the chapter on *Fuchsias* in the U.S.A.—from their first recorded cultivation in 1870 up to the present day. A list of some of the hybrids raised in America is also given.

The author is very modest in describing himself as having had a certain amount of success in raising new varieties. He has produced, and is producing, a completely new race of hardy *Fuchsias*. As a grower, exhibitor, and authority of great repute, his printed knowledge and experience is worthy of reading.

The author includes in his book a list of *Fuchsia* species and varieties both hardy and otherwise. Soils, fertilizers and propagation are dealt with, and the cultivation of *Fuchsias* in the open and indoors and in particular without heat indoors is carefully considered. The labour-saving possibilities of the *Fuchsia* are touched on.

A welcome chapter is given to training plants into standards, pyramids, and conicals, so beloved of the nineteenth-century growers. Photographs of Mill Hill School *Fuchsias* make one realize that some *Fuchsia* varieties can be grown into small trees indoors in England. Excellent suggestions are given for "situations" for *Fuchsias*. Insect pests, and their control, are given prominence.

A chapter is devoted to the art of hybridizing, and the author recommends the collection, in South America, of species not in cultivation in England, for a new approach to producing varieties with larger flowers, and even finer pure colours.

A collection of coloured plates would have added to the book's great interest, but unfortunately the present "set up" in this country has not made this possible.

The book should be on the plant reference shelf of every gardener.

RALPH NEWMAN

"Flowers that bloom in Summer." By A. W. Hatfield. 40 pp. Illus. (Castle Press.) 2s. 6d.

This is a very big subject and it is impossible to deal adequately with it in a short essay of 40 pages. The author in this case has presumably chosen just a few of her own favourites. The illustrations are printed from line blocks to which a second colour in a rather fierce magenta or mauve has been added, which, in a few cases, has been varied with yellow or green; however, it is not very suitable for the range of flowers covered and it is a pity to see a scarlet oriental poppy flaunting a magenta flower.

"The Gardener's Travel Book." Edited for the Massachusetts Horticultural Society by E. I. Farrington. 2nd ed. 278 pp. Illus. (Oxford University Press, New York; Geoffrey Cumberlege, London.) \$4.00 or 24s.

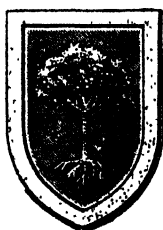
This book is dedicated "to those good Americans whose love of gardens is equalled only by their love of travel" and aims to increase their enjoyment of both by listing under each state of the United States and each province of Canada the more important gardens, landscaped public grounds, nurseries, flower shows, specimen trees famous for their size, beauty or associations, and other places of horticultural interest which can be visited. There are brief descriptive notes about each. To any garden lover planning a visit to the United States and Canada such a work should be most helpful. The section on Mexico is by no means so detailed. The first edition was published in 1938; this 1949 edition contains material not in the earlier one.

"Suppression of Weeds by Fertilisers and Chemicals." By H. C. Long and Winifred E. Brechley. Demy 8vo. 96 pp. Illus. (Crosby Lockwood.) 7s. 6d.

This is the third edition of a work first published in 1934. It has been revised and enlarged since there have been many recent striking developments in this field. This book is intended more for the farmer than the gardener and the majority of the crop references are to farmers' crops, but the market gardener and the horticulturist should also find it helpful, as a summary of methods of control and references to original papers are given at the end of each chapter. A valuable article on weed control in Cereals by Chemical Methods by Prof. G. E. Blackman, from the *Journal of the Ministry of Agriculture*, is reprinted as an Appendix and there is a useful glossary of the Common and the Latin names of weeds quoted.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXXV



Part 10

October 1950

THE SECRETARY'S PAGE ANNOUNCEMENTS—OCTOBER AND NOVEMBER

Shows

TUESDAY, October 10 12.30 P.M. to 7 P.M.	{ Fortnightly Show. Autumn Fruit and Vegetable Show.
WEDNESDAY, October 11 10 A.M. to 5 P.M.	
TUESDAY, October 24 12 NOON to 6 P.M.	{ Fortnightly Show. Tree and Shrub Competition. Floral Arrangement Competition for Professionals.
WEDNESDAY, October 25 10 A.M. to 5 P.M.	
TUESDAY, November 7 12 NOON to 6 P.M.	{ Fortnightly Show. Floral Arrangement Competition for Amateurs. <i>British National Carnation Society's Competition.</i>
WEDNESDAY, November 8 10 A.M. to 5 P.M.	

Lectures

- TUESDAY, October 10 at 3 P.M. "Outdoor Peach Growing" by MR. JUSTIN BROOKE.
- TUESDAY, October 24 at 3 P.M. "Horticulture as a Career" by MR. F. A. SECRETT, C.B.E., F.L.S., V.M.H., and MR. J. L. RUSSELL.
- TUESDAY, November 7 at 3 P.M. "Hardy Heaths" by MR. F. E. W. HANGER.

Colour Films—A remarkable set of films prepared by Shell Chemicals will be shown at 3 P.M. on Wednesday, October 11, 1950 in the Lecture Room, The New Hall. The films give in Technicolor the full life cycle of the Winter Moth, Red Spider and Raspberry Beetle.

Demonstrations at Wisley—The following demonstrations will

be given at Wisley, that on the second day being in each case a repetition of the demonstration given on the first:—

Flower and Vegetable Garden

October 4, 5. Digging, Trenching, Manuring and Composting.
(2-4 P.M.)

Flower and Fruit Garden

November 1, 2. The planting of Fruit Trees and Roses. (2-4 P.M.)

Kindred Society's Show—The National Chrysanthemum Society are holding their late Show on October 31 and November 1 in the Society's New Hall. Fellows' tickets will not admit.

Mr. F. J. Chittenden—With deep regret we have to report the death of MR. F. J. CHITTENDEN, O.B.E., F.L.S., V.M.H., on August 1, 1950. MR. CHITTENDEN served the Society for many years, as Director of the Wisley Gardens and Editor of the JOURNAL, and later as Technical Adviser, Keeper of the Library and Editor of the Society's publications. Since his retirement he had been working on the Society's *Dictionary of Gardening*. A fuller notice will be published in next month's JOURNAL.

Editorial Assistant—The Society has a vacancy for an Editorial Assistant. Some knowledge of horticultural plants is necessary and experience of proof reading and book production is desirable. Candidates must have a good education equivalent or nearly equivalent to a University degree, preferably in Botany or allied subjects. All applications and requests for interviews should be addressed to the Secretary.

Publications—*Camellia and Magnolia Conference Report*. This contains the important papers read to the Conference in April 1950 by MR. G. H. JOHNSTONE, O.B.E., DR. H. HAROLD HUME, MR. H. G. HILLIER, MR. J. E. DANDY, MR. J. R. SEALY and MR. T. T. YÜ, together with the reports of the tour and show. This book includes the first published account of a number of interesting varieties of *Camellia reticulata* from Yunnan. It is illustrated both in colour and monochrome and should form an indispensable book for all interested in the two genera. Price 15s. postage 9d. U.S.A. 3 dollars, post free.

Fruit Year Book, 1950. This contains many important articles on aspects of fruit growing. A special section on fruit growing in Ireland is included. The section on diseases includes articles on the fruit tree Red Spider Mite and its control by DR. A. M. MASSEE, on the new phosphorus insecticides and on virus diseases of fruit trees in England. The discussions held by the Fruit Group are also included. Illustrated. Price 8s. 6d. postage 9d. All publications are obtainable from the Secretary.

Results of the Examination for the National Diploma in Horticulture—This is the most important of the examinations conducted by the Society and is intended for the professional horticulturist. Candidates for the examination must produce evidence of having followed the vocation of horticulture for specified periods; both the preliminary and final examinations involve practical tests conducted at Wisley or elsewhere, as well as written work. In 1950 there were 177 candidates for the Preliminary Examination of whom 28 acquitted themselves sufficiently well to be allowed to take the Final Examination in due course. At the Final Examination there were 58 candidates, 36 obtaining the N.D.H. in the various sections, as follows:—

Section I—*General Commercial Horticulture*

MR. ARTHUR T. PEARN

MR. ALFRED PLAYFORD

Section II—*Fruits in the open*

MR. PETER E. C. KNIVETT

MISS BARBARA A. RAKE

MR. FREDERICK H. OLVER

MR. JOHN D. WARE

Section V—*General Horticulture*

MR. THOMAS J. ALLEN

MR. JOHN G. S. MARSHALL

MR. RICHARD H. ANDREWS

MISS BEATRIX MOLESWORTH

MR. BERNARD T. BARRETT

MR. THOMAS MURPHY

MISS MARY E. M. BROOKE

MR. ROBERT G. NORMAN

MISS DORIS C. BROWN

MR. STANLEY PITTMAN

MR. RAYMOND H. BROWN

MR. BERNARD O'REILLY

MR. KENNETH A. FEATHERSTONE

MR. CHARLES D. REEKIE

MR. VICTOR L. FLAWN

MR. THOMAS M. SHEARER

MR. HAROLD L. FURZE

MR. ANDREW SNODDY

MR. OWEN G. GOODMAN

MR. HAROLD D. TINDALL

MR. JOSEPH A. GREEN

MISS DAPHNE VINCE

MR. CHARLES HATFIELD

MR. ARROLL L. WINNING

MISS MARJORIE E. K. INGRAM

MR. PHILIP L. D. WOOD

Section VIII—*Public parks, grounds and open spaces*

MR. HAROLD F. AUSTEN

MR. TONY C. GEACH

MR. GEOFFREY A. BURROW

MR. WILLIAM C. OLIVER

Gladiolus Thrips—The attention of Fellows is directed to the presence in this country of an American species of Thrips, *Taeniothrips simplex* Morison, on Gladiolus. Severe injury is produced by this pest both on the flowers which become discoloured and spotted and speedily wither and shrivel, and on the foliage which turns brown as though burned. The pest overwinters on stored corms, and further information will be given in the Society's JOURNAL. Plants suspected of being infested with this pest may be submitted for confirmation to The Director, R.H.S. Gardens, Wisley, Ripley, Woking, Surrey.

Royal Society of Arts 1951 Prize—We have been asked to draw the attention of Fellows to the following:

As part of the Society's celebrations of the centenary of the Great Exhibition of 1851, which it originated, and as a constructive effort to assist the nation in its present difficulties, the Council of the Royal Society of Arts propose to award on May 1, 1951, a Prize of a Gold Medal and a sum of £500 for an entirely new and outstanding contribution to the national economic recovery.

Holding the opinion that no line of economic development is of greater importance to this country at the present time than the improvement of its home food supplies, the Council have decided to offer the Prize for: A means of promoting the production or the economic utilization of food in Britain. The proposal may be quite general or may be concerned with any particular branch or aspect of food production.

Any correspondence on this subject should be addressed to The Secretary of the Royal Society of Arts, John Adam Street, Adelphi, London, W.C.2.

WISLEY IN OCTOBER

GARDENS which depend upon the ordinary run of herbaceous plants and flowering shrubs for their embellishment are apt to become very dull places by the time October arrives. By judicious selection of material, however, it should be possible in almost any garden to ensure the provision of flowers until the autumn is well advanced and coloured foliage and berries to enliven the borders well into the winter. Wisley is richly endowed with such plants, and in the brilliant, sunny days so often enjoyed during the latter half of October colouring in the Gardens can be as vivid and varied as at any time in the year.

The flowers that are to be seen depend even more at this season than usual on the weather, but if there are no very severe frosts the Dahlias and Michaelmas Daisies in the floral trial beds should still be colourful, while late flowering perennials such as *Physostegia virginiana* 'Vivid,' *Chrysanthemum rubellum* and varieties of Solidago and Aster help to prolong the display in the Herbaceous Borders. Likewise the Rose Borders and beds of Gazanias near the Alpine House will still be showing fine blooms. Near here autumnal flowering Crocuses will be thrusting delicate lavender, purple or rosy-lilac chalice above ground. Numbered among the species to be found are *C. speciosus*, *C. nudiflorus* and *C. zonatus*.

On entering the Gardens the visitor is greeted by the clear pink flowers of the Belladonna Lily and the deeper tones of *Nerine Bowdenii*. Further to the right are two species of Clerodendron, neither particularly showy but valued for their late flowering season. The first, *C. Bungei* (syn. *C. foetidum*) will, in favoured localities, form a rank growing shrub, but here it is usually killed to the ground, the young shoots springing up again to a height of three or four feet and blooming in the same season. *C. trichotomum* forms a small tree, now in the fruiting condition and very decorative, the shining prussian-blue berries subtended by spreading crimson calyces.

In Seven Acres a serene and truly autumnal picture is created when the sunlight gleams on the purple drifts of *Calluna vulgaris Alportii*, the misty-crimson Irish Heath lit by a few remaining flowers of the white variety and the mingled icing-sugar pink and rusty-brown of *Erica vagans grandiflora*. They form an island of colour surrounded by smooth green lawns backed by the varied golds and reds of Crab-apples, Barberries, Maples, Dogwoods and many more. Dominating the scene are two good specimens of *Salix alba vitellina pendula*, their foliage changing to a clear gold, while a nearby clump of Bullrushes or Reed-mace forms a pleasing contrast in both colour and form.

The Pinetum, too, looks very attractive at this season. The sombre hues of the Conifers seem to respond better to the softer sunlight than to the summer's glare and also form an admirable background for the deciduous trees and shrubs planted among them. Three species of Rhus make a notable contribution to the scene, the Shining Sumach, *Rhus copallina*, changing to deep purple, and *R. Toxicodendron*, the Poison Ivy, to a glowing scarlet. The Smoke-tree *R. Cotinus* (*Cotinus Cogggyria*) changes to a sufficiently flaming colour to warrant the impression of smoke created by the feathery grey seed-heads. The

American *Aesculus parviflora* makes an admirable shrubby specimen plant in this type of situation or as ground cover in light woodland. It has feathery white panicles of flowers which appear in July and August and leaves which turn a clear golden yellow at this season. There are several Maples, notably a group of *Acer saccharinum laciniatum* having finely cut leaves, now pale yellow, with contrasting glaucous under-surfaces, on graceful pendulous branches.

The Azalea Garden is, for the second time during the year, a sea of glowing jewel-like colours changing from day to day, but in lower tones than in its spring burst of flowering. The Viburnums have been hung with scarlet or black fruits for some time and now their foliage is colouring as well. Among those outstanding are *V. foetidum rectangulatum*, *V. Opulus aureum*, *V. tomentosum Mariesii* and *V. alnifolium*.

On the rock bank at the end of the Award of Garden Merit Collection the buttercup-yellow Crocus-like flowers of *Sternbergia lutea* are appearing. *Prunus Sargentii* and *Euonymus alatus* alike are clothed in a mantle of cardinal red.

In the Wild Garden a thirty-foot specimen of *Oxydendron arboreum* is beginning to change from gold to scarlet and *Disanthus cercidifolius* has crimson leaves suffused with orange, shaped like those of the Judas-tree, which drop to reveal small crimson spider-like flowers borne back to back in two-flowered heads. Among the other shrubs noted for their foliage in autumn are *Fothergilla monticola*, now a sheet of brilliant yellow and orange, and the species of *Enkianthus* especially *E. perulatus*, which flowered so well this spring. There are patches of the pretty *Cyclamen neapolitanum*, most of the flowers of which are over, but the marbled leaves are most attractive now that they are fully expanded and in a like manner are carpeting the ground beneath the Japanese Maples in the Alpine Meadow. These Maples, pleasantly coloured during the summer, are now displaying dazzling shades of scarlet, bronze and gold.

On the Rock Garden most of the alpenes except *Polygonum affine*, *P. vacciniifolium*, and a few late flowers of *Gentian* and *Verbena chamaedryfolia* have faded, but *Fuchsia magellanica discolor* is still blooming and the creamy-white heads of *Saxifraga Fortunei* are mingling at the water's edge with the heavy yellow-green plumes of the Royal Fern.

In the Stove House there are many decorative foliage plants and Orchids, while the Temperate House is gay with a variety of plants such as *Tibouchina semidecandra*, *Cassia corymbosa* and the first white flowers of *Camellia Sasanqua fragrans*. The side staging is bright with Pelargoniums, Nerines and Begonias. A collection of succulent plants will be of interest to many especially now that *Faucarias* and other genera are coming into flower. In the middle bed are the scented blooms of *Rhododendron mucronatum* and *Luculia gratissima*, as well perhaps as the first flowers of *Acacia platyptera*.

The Abutilons have been blooming for some months in the Half-Hardy House, joined by the blue flowers of *Lithospermum rosmarinifolium* and *Aster Pappi*. Among the bulbous plants are Nerines and Zephyranthes, while trained along the roof supports *Solanum jasminoides* and a small-flowered yellow Clematis, *C. nannophylla*, continue to flower.

THE HYBRIDIZING OF LILIES

AN AMATEUR'S APPROACH

O. E. P. Wyatt

(Lecture given on June 27, 1950, COL. F. C. STERN, F.L.S., V.M.H., in the Chair)

I WISH at the outset of my talk to emphasize my inexperience; in comparison with the experiments of others, not only in this country but in America, Canada and New Zealand, my own have been made on a very small scale. When reading through the learned and substantial lectures given to you in the past, I am uncomfortably aware of my amateur status and of my lack of qualification to address you.

I suppose that it is a spirit of adventure which prompts an amateur to try his luck in hybridizing Lilies; he wishes to raise a "new" Lily. He is by no means unconscious of the beauties of those species with which Nature has adorned various corners of the Northern Hemisphere and which Man has transplanted to his gardens with varying degrees of success.

He knows also the best hybrids, such as *testaceum*, *aurelianense*, 'Shuksan,' and he has heard of the great hybrids of the past, even though he has never seen them, and they seem to cry out to him from the bonfire—not we hope from the compost heap!—to raise strains which will emulate their glory; these must be such as will live and live vigorously. He must not be thwarted by those who say that no hybrid yet produced has rivalled the beauty of Nature's handiwork; it may or may not be true, but is irrelevant for his purposes. For most of the species have much too precarious a hold on life in English gardens, and hybrids must be bred which have good constitutions, which are not temperamental, and which are not easily killed by disease, besides being as beautiful as possible. We want tough Lilies—and that is to be the main theme of my lecture. And I believe it can be done. Superior and disease-resistant strains have been produced in other vegetables, crops and flowers. Potatoes and Wheat are perhaps outstanding examples. Why not in Lilies? We are at the beginning of Lily hybridization and it will take many generations of hybridizing to produce superior strains, but unless it is done Lilies can never become "popular" plants for the ordinary garden. Yet that is the vision: to every garden its own Lily bed!

What qualities should we then expect of our superior strain? Beautiful in their colours and shape (but not necessarily large) and lush in foliage; hardy in constitution; resistant to disease; sweet smelling; self-supporting—able to stand up on their own without continual staking and tying; easy to reproduce vegetatively; and I understand that in the course of time it should be possible also to produce hybrids which come true from seed.

Let us consider some of the qualities in greater detail.

COLOUR AND SHAPE

One must have foresight in deciding what crosses to attempt. Like most amateurs I started by hybridizing indiscriminately, by going out into the garden and cross-pollinating any two Lilies which happened to be out. As an example, I crossed the true *L. Roezlii* with *L. Parryi*—and I got what I deserved. Each parent is beautiful in its own particular way, but the hybrids, which are all very similar, show the worst features of each parent: the uneven raggedness of the flower of *L. Parryi* and the rather weak colour of *L. Roezlii*. In my opinion, some of the *Hansonii* and Pink Martagon crosses are open to the same objection; the colour is washy or at best is a displeasing mixture of pink and yellow, even though they seem to be more resistant to disease than many others and are easily reproduced vegetatively. I do not really feel great enthusiasm even for *L. × 'Dalhansonii'* since the red and orange are inartistically blended. I raised a seedling myself from *L. × 'Dalhansonii'* (cross-pollinated back again with *L. Hansonii*) which shows more orange colour and cheers the flower up a little perhaps, but it is not a Lily which has exceptional appeal for me, though it is a very strong grower and satisfies many of the other qualities of a superior strain.

But I am beginning to learn a little wisdom; last year I crossed *L. fresnense* with *L. Parryi* and *L. × 'Shuksan'* with *L. Parryi*, and both in colour and shape the resulting seedlings should be attractive. There are hundreds of seedlings of each of these. One must try to visualize the possible appearance of the crosses one makes and I instance these as illustrations of improvement in my taste and forethought. (Incidentally, *L. fresnense* puzzled me for some years when it was considered to be a variety of *L. nevadense*. It bears little resemblance to it; I have several times raised it from seed and it invariably comes true. I am glad to see therefore that in the new book, *Lilies of the World*, it has been raised to specific rank.)

HARDINESS OF CONSTITUTION

If the parents are hardy, the hybrids should be hardy. I raise almost all my hybrids in an open frame, under a wall facing north, on which the lights are put on only in heavy rain or snow—and I live in Northamptonshire, which has not a particularly mild climate. They have to put up with any amount of frost and so far as I know I have never lost a seedling from cold. I have almost a fetish about this; I cannot speak scientifically, but I firmly believe that if everyone would courageously raise their Lilies in the open, we should in the course of time have much hardier stocks and should lose fewer Lilies through "lack of constitution," though I am aware that this may present difficulties in the hotter parts of the country. Apart from all else, seeds and seedlings in the open need much less attention: an occasional watering and a little weeding is all they get from me. Needless to say, I should not attempt this treatment for seeds of the first generation from Lilies which were not themselves hardy; but I see no reason why subsequent generations should not be selected gradually for hardiness. I believe that in America a hardy strain of *L. sulphureum* has been raised in this way.

I do not find *L.* × 'Pride of Charlotte' at all a good doer with me, and it lacks constitution (perhaps because of too much vegetative propagation by bulbils). Therefore I have crossed it with its close relation—MR. BOWLES'S *L.* × 'Princeps,' which fares very well; the seeds have germinated well and I hope to produce from them a Lily which has the charm of *L.* × 'Pride of Charlotte' and the toughness of *L.* 'Princeps.' This, I believe, is the right method of procedure in order to strengthen constitution. It will be interesting too to see whether the strain produces bulbils (as both parents do) and whether bulbs grown from them will endure better than does *L.* × 'Pride of Charlotte' even though reproduced vegetatively.

I have brought up to show you an attractive hybrid between *L. Martagon album* and the difficult *L. Kelloggii*; its flowers are very similar to the latter but it may prove to have the constitution of a *Martagon*.

RESISTANCE TO DISEASE

Similarly it may be true that Lilies grown thus toughly may prove to be less prone to disease. Of course one should use as parents one's most vigorous specimens and this is likely to be an important factor also in eliminating disease. But in general the production of disease-proof Lilies is a long-term policy, requiring much more than one man's lifetime. In choosing hybrids for further crossing the first consideration should be resistance to disease; this should take priority even over colour, shape, size, height and every other desirable characteristic, however much heart-burning it may cause.

Seeing what losses in Lilies were caused by neglect in wartime it is obvious that most Lilies are too pampered, and one of the first aims of the hybridizer is to produce strains which will be less dependent for survival on human agency. Spraying and dusting may be necessary evils, but they must be considered as transitory evils; the ultimate hybrids must be able to hold their own without help whatever the wind may bring or aphid inject.

SELF-SUPPORTING

The acquisition of this desirable attribute runs the risk of excluding from hybridization some of the most beautiful Lilies—e.g. *L. Davidi* var. *Willmottiae* and *L. Wardii*. I have raised one quite good hybrid from crossing a *Scottiae* hybrid back to *L. Willmottiae* which is good except for the characteristic obtained from its father of inability to stand upright soberly. It has the great merit of being one of the first Lilies to bloom each year. I call it 'Jock Scott.'

But the staking of Lilies takes much time, and one of the characteristics of a good Lily is that it stands up well. Incidentally I have found dead branches of bamboo (*Phyllostachys*) with the side shoots trimmed a most excellent means of support. The Lilies need no tying; the support can be put in as soon as the Lily appears above ground, and the flowers of the Lily hang over it in a natural way.

SCENT

Do not let us fall into the besetting sin of the last generation of Rose hybridizers and forget scent! Personally I have never tried to hybridize *L. pyrenaicum* with any other for this reason only and I advise you to shun it also. There is little doubt that some of the hybrids produced from Lilies with a pleasing smell will be sweeter than others—if so choose the scented form if you can. To the townsman the scent of Lilies is associated with funerals; to us who are Lily worshippers it is associated with the happiest of horticultural joys. Scent therefore is of importance and must not be neglected, even if it has not the foremost claim on our attention.

Finally, in connection with choosing the victims for one's experiments, it is important to be able to make a guess at the possibility of success. I understand that in this matter the scientists cannot help us much, since almost all Lilies are diploids, even though one or two have some fag-ends of chromosomes thrown in just to make their sexual behaviour a bit unpredictable. But this does not get us far; for we all know how impossible to effect some crosses seem to be. I always think that the best "amateur approach" is to consider the bulbs; if the bulbs of two prospective parents are similar in structure and habit, a cross-pollination is likely to be effective. For instance, you will not easily make a cross between *L. regale* and *L. Parryi* because the nature of their bulbs is so different. For years I have tried to cross *L. Martagon Cattaniae* with *L. Duchartrei Farreri* but it has never succeeded, and my intuition should have forewarned me of failure since their bulbs are so dissimilar. However, there may be no scientific basis for this and there are probably many exceptions. I have often been told that MAX LEICHTLIN used to say that Lilies from one part of the world are likely to cross with Lilies from the same part. Perhaps he was saying the same thing as I am from another point of view; for it is roughly true to say that many of the American Lilies have similar bulb structure to one another, so do many of the Chinese and so do many European.

A gardening friend, whose opinion is respected by all of us, has suggested to me too that it is useless to put pollen from a Lily with a short style on to one with a long style in case its pollen is only meant to have a short tube which would not reach far enough on a long style to reach the ovary. That also appears to me to be an interesting approach to the matter.

But whether by guess or judgment, during winter evenings in the dreamland of paragon Lilies, the amateur decides what crosses to attempt and sets out in his garden on a sunny mid-day in summer; if he is wise he will have previously removed the anthers from the prospective seed parents before the flower opens. Personally I do not bother to do this in cases where she is unlikely to set seed without my help, e.g. *L. × testaceum*. I have no claim to originality in my procedure; I do it rather drastically, carrying, in my fingers, pollen-bearing anthers or a whole flower to the bride. Camel-hair brushes, rabbits' tails, tin boxes, tweezers and wood alcohol form no part of my equipment. Doubtless they will do so when I cease to be a beginner! I was much interested to read in the last Year Book that pollen can be preserved for many months;

clearly I have a great deal to learn. I pollinate each of the flowers concerned two or three times in a week and cover the whole of the stigma thickly: I am told that this is quite wrong, but it seems to meet with success. Apart from all else it appears to me to make it difficult for bees or other helpers to spoil my work by bringing some other unwanted pollen; I get in first and my chosen pollen is so thickly laid on that no other can reach the stigma. With some fear of contempt on the part of the professionals amongst you I confess that I do not cover the Lily subsequently with a muslin bag.

But I am at least sufficiently methodical to label carefully every flower pollinated. One soon learns how unreliable one's own memory is and how difficult is identification of an individual seed pod in the space of a few months.

When the seed case is on the point of splitting in the autumn I gather the capsules, store them in envelopes in a sunny window, shake them out as soon as they are dry, store the seeds again for ten days or so in envelopes in the sunny window, giving them a shake every day or two to ensure ventilation, and then sow them at once. I am always ready to learn, and I am hoping to be told how my plan of campaign may be modified or improved. My emphasis on "envelopes" is that I believe the rays even of an autumn sun may scorch unprotected seed; and my reason for planting them at once is not only that most seeds seem to germinate more quickly if freshly sown, but also because I have found that seeds often become too damp or too dry during the winter unless stored under ideal conditions. Even with those seeds whose germination is hypogeal there is nothing to lose by immediate sowing.

The seedlings remain in an open frame for eighteen months; less in the case of some species, and occasionally more. But my second great fetish is to get the seedlings into their permanent positions in the garden as soon as I can. Search as you will in the textbooks and Year Books, and you will find little agreement on this point—the correct time at which to move seedlings or bulbs from scales to their permanent quarters. Last autumn we had an interesting discussion on the matter at a Group Meeting up here and divergent views were expressed; but amateurs would do well to remember that the nurserymen's problem differs from ours: their bulbs must be moved again, ours need not be, and I personally believe that the sooner their roots are allowed to develop permanently the better will they thrive. When moved young, their roots are small and only carelessness will break them. Out of 380 bulbs grown from scales of my American Lily hybrids taken in the autumn of 1948 and planted in permanent positions in May 1949 only 19 have failed to come up this year; in spite of the 1949 drought I did not once water them after they were first planted. A few of them are actually flowering this year. Greedy slugs or wireworm can be held responsible for a 5 per cent. loss, and I am grateful to them for controlling their appetites with such kindly restraint. However, I am not always so fortunate; this year, heavy rain, frosts, cold winds, heat wave and drought in quick succession have caused a sharp rise in the rate of infant mortality.

But I am wandering from my subject.

In the course of time, after some years of hybridizing, with many

failures and some successes, an amateur is faced with the big problem of the number of seedlings which he has on his hands. In the first generation he may have produced some good hybrids; some may appear strong in constitution and free from disease, others of attractive colour or shape; but he cannot stop there. He must cross-pollinate again or pollinate back to or from the original parents, or still better to other stocks of the same species, if he is to produce a really fine constant strain. Then, if he is a successful hybridizer, he will have thousands of seedlings needing attention; unless he has unlimited time himself or a very large purse the task is likely to be beyond him; for even in a reasonably large garden there is some limit to the number of Lilies which can be grown in suitable sites. Thus, he will come to the conclusion reluctantly that he must limit his activities to one or two selected strains, especially if he has reason to think that no-one else has been successful with them. I have not dabbled in the hybrids of *L. × aurelianense* because others are doing it with outstanding results: I leave it to them.

Take, for instance, the *testaceum-chalcedonicum* group. In this I have had some success in hybridizing these two in the first generation after many years of attempt, and four of them have flowered. I have been able to show three of them up here and I am hoping some time to show the fourth, which, in my opinion, is the best of them all. I have raised a certain number by scales from these, and a point of interest is that all the young bulbs of two of them, planted in the open, had young leaves above ground at Christmas time. It would seem that they have inherited from their grandparent, *L. candidum*, a tendency to be ever-green. Fourteen degrees of frost this winter did not seem to perturb them at all; the young leaves were unaffected. But they are slow growers.

I understand that breeders in America and New Zealand are also on the move in developing these. (In passing may I say how much I appreciated the wonderfully interesting article in the 1949 Year Book on hybridizing in New Zealand.) Last year I hybridized these four back to their ancestors and vice versa: *testaceum*, *chalcedonicum* and *candidum*; and I have now 400 seedlings from the various crosses. There should be some good things amongst them and I can probably deal with that number. The seeds were sown in October, and the seedlings were beginning to show above ground on March 1 this year—in an open frame, which, as you will remember, is at the foot of a north wall.

But however well they flourish, I have no right to expect that our "paragon" Lilies will appear for several generations yet, and by about 1955, when these will have flowered and been cross-pollinated, the task will clearly be beyond me, let alone subsequent generations. I am learning that, to be done effectively, Lily hybridizing must be carried out on a very large scale.

Suppose that in 1953 or 1954 I have in flower 100 of these seedlings, I shall try to pick out a certain number which are of good constitution, free from disease, whose flowers are good in colour and shape; then if I have the courage I shall eliminate from these any which are scentless or do not stand up well. If I am lucky I shall hope to have perhaps 10 which can pass all these tests. Then they must each be scaled and the

scaled bulbs tried out in normal, or even poor, horticultural conditions in order to prove themselves; for I never feel really happy with a Lily unless I can reproduce it from scales and be sure that it will grow in an average environment. At the same time some of the flowers must be re-pollinated with other stocks of their ancestry; some possibly with *L. Henryi*, which appears to be so good a pollen-parent, or with other species. And so the process should go on.

Personally I am sure that there is a great future for the hybrid Lily and we have as yet only touched the fringe of the possibilities; we all take too short a view and expect to produce in one generation or one man's lifetime, what can only be expected to appear in several generations of hybrids and in two or three human lifetimes. Perhaps the Lily Group will at some time consider the possibility of taking over the later stages of experiment of hybrids which are proving worthy; for a range of perfect hybrids may be beyond the power and span of an individual amateur.

Before I leave the *chalcidonicum-testaceum* hybrids, there are two or three further points of interest to note.

The original cross is the stumbling block. For years I tried to cross *L. × testaceum* with *L. chalcidonicum maculatum* and vice versa. Several times the pollinated *L. testaceum* set seed, but usually it did not germinate, or if it did the stray seedlings perished in infancy. I have one more seedling growing from 1948, which is apparently flourishing; but from crossing last year (a bumper year for Lily seeds I found) five only have germinated, whereas the hybrids crossed back with their parents produced abundant fertile seed. When the hybrids were crossed with one another, no seed pods set at all.

The group of *L. × testaceum*, with which the successful cross was made, has an interesting history. I bought three bulbs many years ago and they were the first Lilies I had ever possessed. Through ignorance or ill-luck or mismanagement, they failed to grow; I put a garden fork under them and the bulbs fell to bits. I left the scales scattered about the ground, and my surprise was considerable when next year three baby Lilies grew on the site! In those days I had never heard of growing Lilies from scales. I did not move them and there they are now on the same spot and for years they have flowered with great vigour. They are generally more than 7 feet in height and have borne as many as 13 flowers on one stem. From such a haphazard start in life, nearly resulting in infant mortality, these have been the seed parents of the hybrids which we have been considering. The moral to be drawn, one would say, is not merely to plant out baby bulbs in their final site but even the scales! But I do not make this as a serious proposal—yet!

Finally, may I deal briefly with two other crosses which I have made and which have a promising future? I have exhibited in the last two years some first generation hybrids from a cross between *L. nevadense* and *L. Parryi*, and they seem to have been received warmly by those who have seen them. (Fig. 197.) There are fifteen of them, which seemed to me to be good enough to name, and almost every one had some attractive feature about it; they are mostly vigorous, easily scaled and are an attractive sight in flower amongst *Impatiens Noli-me-tangere*, which

seeds itself around them each year. But the most interesting feature is their diversity; at the paternal end of the group is a hybrid almost indistinguishable from *L. Parryi*, and at the maternal end almost an exact replica of *L. nevadense*. Twelve Lilies between them can be lined up at sight ranging gradually from one parent to the other, both in flower and leaf, leaving number fifteen out of the picture, for it has a curious well-formed brownish flower unlike either parent. If only they would all flower together (which they do not do), they would make a remarkable exhibit. Five of them should certainly be crossed with one of their parents; or possibly a cross with some other species would be preferable since both parents have a regrettable tendency to be ragged. Alas, owing to the claims of the Lily Show, they were not available for hybridizing last year, and I have not yet begun to raise a second generation. I have, however, made again the original cross between *L. nevadense* and *L. Parryi* and have distributed some of the seed to those who might like to join with me in raising seedlings from it. You will have noticed how valuable I have found the pollen of *L. Parryi*, which I find an excellent parent. *L. Parryi* itself grows well with me in spite of the presence of enough lime in my soil to turn any Rhododendron yellow in a year.

Whether I have time and space to proceed as thoroughly as I should in developing this group of hybrids by crossing back and crossing with kindred species seems doubtful. I believe it has great possibilities.

And lastly there was a cross between *L.* × 'Shuksan' and *L.* × 'Burbankii'—not that I know what *L.* × 'Burbankii' is; nor does anyone else, since it is an omnibus name for a whole group of hybrids, and I have two or three forms in my garden. But these germinated in scores, and after planting a certain number in well-prepared ground, I planted others in out-of-the-way parts of the garden and threw the rest away in despair. But when these which were luckily placed had bloomed and had shown real quality, I collected the survivors and gave them worthy homes. They are a most vigorous race; every tiny scale broken off produces a bulb—some of which have flowered in twenty-two months from autumn scaling. Lily enthusiasts who have seen them have expressed delight with them. Some are bright red in colour, some orange, some brown, some buff; most are fairly heavily spotted. Some have attractively pointed petals with pink tips which give them a debonair appearance. In the second year of flowering some of them had twenty or more flowers on a stem, but in the third year many deteriorated because I had planted them too closely and they needed division. More important still, they seem to be free from disease so far. I have scaled some of the best of them and have planted the resulting bulbs in groups in which I think they will show off their individual characteristics to good effect; when planted together in their original site with their fellow hybrids their individual features tend to be blurred. (Fig. 198.)

Now these are several generations removed from the original species, and they seem to lend support to my belief that if we go on hybridizing long enough we shall produce hybrids which for various reasons will thrive more vigorously in English gardens than do the species. They have in their ancestry *L. pardalinum*, *Humboldtii* and *Parryi*.

I am conscious that I have had beginner's luck as a grower of Lilies. I do not think that my soil is particularly suitable; almost all of it contains lime; much of it has heavy clay beneath it though some is sandy. But even clay is not without its value; in some places I have dug down to four feet and got through clay and into sand in the centre of my Lily bed, put in a clinker sump and shaped the clay on the rest of the bed to drain down to it. Lilies grow very well in such places; the ground never becomes stagnant, and yet the clay ensures that it never dries out.

But again I am digressing and I must not venture in a discussion on soils or planting. But such success as I have achieved in growing hybrid Lilies, I believe, must be attributed to three main factors:

Firstly, deep cultivation of the beds in which they are planted; spend 5s. on a Lily and £1 worth of labour in making a home for it.

Secondly, refusal to pamper the seeds and seedlings. Do not coddle them; grow them in the open and protect them only from heavy rain. If they are weaklings, the sooner something kills them the better; for if they survive, they will only waste your time. It was the lecture of MR. G. M. TAYLOR in 1932 which guided my steps in this direction, and I acknowledge my debt to him.

Thirdly, removal of the seedlings (or bulbs from scales) to their final home as soon as ever they can be handled. When young, the whole root can be removed unbroken; make a hole with a trowel, form an apex inside the hole and spread out the baby roots down the sides of the apex. Down the roots will go and in a few weeks they will be inches deep, oblivious to drought, and will race away to the flowering stage without further help from man.

Perhaps as a result of my talk other amateurs will think it worth while to try my "tough" methods. If so, all they need is a small plot of ground and plenty of patience, and their reward will be much happiness and adventure in the Elysian fields of Lily hybridizing.

SHOW AURICULAS

THE EDGED VARIETIES OF THE FLORISTS

George M. Taylor

THE old "edged" Auriculas so popular with the enthusiastic artisan florists two centuries ago, are a most remarkable development of this particular genus of hardy alpine plants, and in this group the formality of the flowers together with their unusual colour schemes reaches an extreme limit. One of the most pleasing features is the farina or meal so liberally bestowed on leaves and stems, and always in the centre of the flowers. The plants, indeed, when in flower are literally a symphony in silver, and even to-day they are the most appreciated of all the Auriculas.

The Show Auricula has been in cultivation for many years and the literature in connection with it is extensive but actually provides very little information about its origin and main lines of development. There is plenty of detail regarding the weird composts for growing plants, and

ample descriptions of varieties. GERARD cultivated the Auricula in 1597, under the name of 'bears' ears' or 'mountain cowslips,' and one of the first records regarding it is due to CLUSIUS who, in 1598, noted plants growing in a garden in Vienna and learnt that they were natives of the Alps. Tradition has it that they were introduced into this country even earlier than GERARD's day, and it is thought that they were brought here by Flemish weavers driven from their homes by persecution, and the fact that GERARD grew plants would seem to confirm this. CLUSIUS records but one form in his *Herbal*, and it would seem to be *Primula Auricula* itself and no mention is made of its vari-coloured hybrid descendants. From the days of CLUSIUS and GERARD onwards there are records, many of them in considerable detail, which prove the existence of a number of very distinct forms, but it was not until the later half of the nineteenth century that KERNER demonstrated the starting point of the garden Auricula, and that it was to be found in the natural crosses which occur in the alps where *P. Auricula* and *P. hirsuta* happen to be growing together.

A study of Auriculas indicates that a number of mutations has been detailed, showing clearly that they are particularly subject to these spontaneous "breaks." One has only to look at cultivated plants to note how markedly they resemble one of their parents, *P. Auricula*, which in the wild state has given rise to a notable series of subspecies and forms, many of whose distinctive features can be recognized in it, sometimes quite definitely, sometimes only vaguely. On the other hand the more stable *P. hirsuta* seems to have been responsible for the anthocyanin colours of the flowers and the bright green foliage of the Alpine and green-edged Auriculas. The foliage of *P. hirsuta* varies but little; it is entirely devoid of meal; the leaf edges bear small glandular hairs and the colour is a distinctive vivid green. The foliage character of *P. Auricula* is somewhat more complicated. This species is an aggregate made up of a number of subspecies and forms. The type *P. Auricula* is mealy, but the subspecies *P. Auricula ciliata* is completely free from meal even at the base of the calyx.

In the type *P. Auricula* the foliage may carry anything from the merest suspicion of powderings to a layer of farina which is actually so intense that it flicks off in patches. This matches the grey and white-edged forms, for these do not form two precise groups as indicated in the classification of the florists, but are a continuous series beginning with forms having so little meal that they appear to be green-edged and ending with forms which are so covered with meal that they could well be described as "encrusted."

In *P. Auricula Bauhini* (including *P. A. albocincta* and *P. marginata* of catalogues) we have still another meal-bearing subspecies. Here the degree of mealiness is somewhat variable, but the main characteristic is that the meal forms a very dense coating on the margins of the leaves, so giving them a decided clean cut silvery edge. This can be noted in the foliage of many Auriculas, and in the petal-leaves it has actually provided the starting point of the only grey-edged forms that were tolerable on the show bench, that is those in which a distinct margin of silvery white bounds a zone of greenish grey.

It would seem that the edged forms have arisen from mutations amongst the species, subspecies and their hybrids already noted, and it is now clear that the faculty of mutating in different directions must have been carried by the first of the natural hybrids imported into this country. These mutations, step by step, provided a number of new and extraordinarily distinctive features which were at once noted by the keen old-world florists, and they segregated them, developed them, and in due course they furnished the bases of the edged flowers as we know them to-day.

The edged group is divided into three sections. These are green-grey or white-edged flowers, and between the edge and the paste there is a band of colour. This is called the "body" colour. The type of flower preferred by the florists was one in which the body colour is of an intense black, but the colour range is actually a wide one. This is particularly the case with the selfs, a group now bracketed with the Show Auriculas. This group is characterized by the fact that the throat of the flower is circled by a clean cut ring of intensely white "paste." The colour range in the selfs is wider than that of the Alpine Auriculas, and the opinion has been expressed that it is questionable whether any other flower in cultivation can show such a diverse series of colours.

The old florists were very particular about the standard set for the flowers. They had four distinct qualifications for the edged varieties, and unless these were embodied in the flower it was rejected as useless for show purposes. These qualities were, first, the eye or tube, which should have the stamens lying in it, but sometimes has the pin-headed stigma instead, which is a defect; second, the paste or circle of pure white surrounding the eye; third, the body colour, a circle of some dark tint, as maroon or violet, which feathers out more or less towards the edge, but is the more perfect the less it is so feathered, and is quite faulty if it breaks through to the outer edge; fourth, the margin, which is green or grey or white. These circles should be about equal in width and clearly defined, and the nearer they are to this standard the more perfect is the flower. The photograph (Fig. 201) shows a white-edged seedling raised by me, and I think the flower would have satisfied the most critical of the old florists. Fig. 202 shows two typical Alpine varieties for the sake of comparison. They are only young offsets flowering for the first time.

The nature of the Show Auriculas has long been a matter of speculation, but an examination of the corolla of any of the edged varieties will show that the structure is identical with that of a true foliage leaf. These edges, without any possibility of doubt, are actually leaf structures, and the flowers are examples of virescence, frondescence or phyllody. Although this phenomenon is rare amongst garden plants it is common amongst wildings. We have, for example, the green Primrose, and there is a double form although I have never heard of it being found wild. There is, too, a double green Auricula. It was thought to be lost, but I have obtained it from an old garden in Ireland.

The cultivation of the Show Auricula is really a very simple matter, but in its halcyon days when enthusiasm for the flower was at fever-heat in the eighteenth century and the first half of last century, the recipes for

potting composts were formidable in the extreme, and some disgusting mixtures were recommended by expert growers. Dreadful examples are given in the books of such writers as JAMES JUSTICE (1754), JAMES MADDOCK (1792), WALTER NICOL (1798), THOMAS HOGG (1812), and ISAAC EMMERTON (1816), all of whom were keen growers. HOGG, however, writing in his book *A Concise and Practical Treatise on the Growth and Culture of the Carnation, Pink, Auricula, Polyanthus, Ranunculus, Tulip, etc.*, states that—"the different composts used by florists in growing this flower are almost as numerous as the florists themselves," and remarks "Persons often take extraordinary pains, and much unnecessary expense, to injure, if not destroy, their flowers. Weak minds are soon misled by quackery and novelty, having no sound judgement of their own; and quackery, even in the growing of flowers, has as many followers as in any other line." There can be no doubt whatever that the using of such loathsome mixtures for the growing of Show Auriculas had the effect of sickening the plants and in consequence there were many losses, and these lovely things were looked upon as miffy subjects and difficult to grow. There is a vast literature on the subject, and I have carefully gone over most of it. After reading it I am not astonished that the "dark age" set in for Show Auriculas. The day of empiricisms in the growing of these flowers is, happily ended.

The best compost for potting is made up of three parts good fibrous loam, two parts thoroughly decayed leaf mould, and one part of sharp sand. I have never had any trouble with my plants when grown in that mixture. The matter of a suitable size of pot is important. They should never be grown in large pots, and a 4½-inch pot is quite large enough. Potting should be done in July, and any offsets can be propagated by removing them in that month, and potting into small sixties.

Auriculas are sometimes attacked by greenfly, and if that happens a spraying with a good nicotine insecticide will prove effective. The most serious pest is Woolly Aphis. This puts in an appearance at the end of June and continues throughout the summer. It is generally observed round the collars of the plants just at soil level. It can be quickly eradicated by dabbing methylated spirits with a brush over the affected parts, but care must be taken to use sparingly. This pest also attacks the roots of the plants, but only where they have access to air, generally round the inside of the pot.

Show Auriculas are very hardy and are most impatient of heat. They must not be grown entirely in the open as exposure to rain, especially heavy April showers, causes the white paste to run, completely spoiling the exotic beauty of the flowers. I only keep my plants in the open during July and August, and they are then transferred to a cold frame to winter and to flower in spring. The frame is in a position that is only in sunshine until mid-day, after which it is in shade. During the winter months the plants are kept very dry, and water is not applied until the beginning of March. The plants love a cool soil and shady situation.

Seed is very difficult to obtain as the flowers produce pollen very sparingly. I generally manage to obtain a little seed and have raised a number of seedlings from green-grey and white-edged flowers. I sow the seed so soon as it is ripe, and this must be very carefully done and

must be sown evenly on a level surface of fine sandy loam, preferably in a pan, and very slightly covered with fine soil. If the seed is sown deeply it will not germinate. The best seedlings are exceedingly weak, and all such should be very carefully tended.

The Auricula has been an inmate of British gardens for over three hundred years, and the Show varieties are still greatly prized by those who know them as one of the choicest flowers. Two hundred years ago they were objects of enthusiastic admiration by the old artisan florists, and were cultivated extensively by the operative manufacturers and artisans near Manchester, Paisley and other large towns. Like the Tulip, Pink, etc., it was essentially a poor man's flower, and as JOHN CLAUDIUS LOUDON put it—"a fine blow is rarely to be seen in the gardens of the nobility and gentry." The small space required for their cultivation was convenient for many folks of limited means like the old artisans, and as the Auricula is capable of withstanding the smoky atmosphere of towns, it became a favourite with those whose garden accommodation only extended to their window-sills or even the leads on the top of their houses. The old Lancashire growers had no frames or lights, but used weather boarding fixed against some wall or fence to defend their plants against rain or snow. They had many losses, but these were mainly due to the dreadful soil mixtures they employed for potting. Those old nostrums are now exploded, and the more rational treatment which has taken their place enables us to grow healthy and vigorous plants.

PLANT REACTIONS TO CHEMICAL AND PHYSICAL CHANGES

Dr. Louis E. Blanchard

(ONTARIO, CANADA)

IN 1918 Kraus and Kraybill described the significance of the carbohydrate to nitrogen relation in Tomato plants. When the carbohydrate to nitrogen ratio is very high, the limited amount of nitrogen curtails the synthesis of protein. A high carbohydrate to nitrogen ratio, where ample nitrogen is available but carbohydrates in soluble and storage forms are in excess, results in abundant fruiting. A plant in low ratio, with abundant nitrogen and carbohydrates, but where photosynthesis cannot produce carbohydrates in excess for metabolism and storage, responds with an active vegetative growth. There is no reproductive response at this nutritional level. This principle applies to the majority of plant species, including cacti and other succulents, and is vital in a growing programme where quality production is the goal. Naturally, in a low carbohydrate to nitrogen ratio, where the supply of materials is insufficient for adequate assimilation, the plant is in distress because of starvation, and responds with a frail vegetative growth.

In nature there is a balance between the root and shoot systems whereby the plant is kept in a nutritional balance conducive to maximum seed or fruit production. Quality is sacrificed for quantity

inasmuch as the principal objective is reproduction. Small seeds or fruits in very large numbers offer a better chance for survival than a few specimen products. This is natural economy. The ratio of root and shoot systems essential for proper balance through the life-cycle of a plant will vary with its habitat. In the desert, Cacti and other xerophytes, because of the scarcity of food and water, may develop a huge root system strikingly out of proportion to its shoot. HASELTON (1) has recently described and illustrated such an unusual relationship. A Cactus (*Opuntia echinocarpa*), less than 2 feet tall and $1\frac{1}{2}$ inches in diameter, developed primary roots over 35 feet long and this definitely only represented a small fraction of the secondary root system.

In cultivation, our objective is to produce plants and blooms of unusual quality and colour. In order to obtain a high but adequate carbohydrate to nitrogen ratio, we disturb the natural balance with its tendency to quantity production to one that is qualitative in character. This, in part, is accomplished by pruning the plant whereby photosynthetic production is reduced, without changing the nitrate absorption by the roots. Complete fertilizers or nitrates, according to needs, are also used in maintaining such a balance. The pruning must not be too severe, as it is desirable to have carbohydrate production sufficiently in excess to allow storage. In late summer, nitrogen should not be dominant in the culture of tuberous plants, as they must store food for the next generation. A chemical imbalance would produce inferior tubers. They should be grown until the tops are killed by frost so as to allow the maximum food accumulation.

In our greenhouses, our Chrysanthemum plants (and others) are pinched, pruned and disbudded to maintain these particular ratios. The blooms and colour of plants so treated are decidedly superior. This disturbance of natural growth has its limit of toleration. If the nitrate level is made very high in proportion to the carbohydrate content of the plant, it will respond with protein production for assimilation into protoplasm, as is evidenced by heavy top growth. Such an imbalance makes food storage impossible. I believe such a condition is frequently responsible for small inferior types of bloom or blind growth, depending on the degree of imbalance to the plant.

The life-cycle of blooming plants is so short that there is never complete recovery from any setback. In pricking off seedlings, even with the best technique, there is a shock of transplantation that takes its toll. Last August (1949) we planted stocks in two 75-foot benches in our greenhouses. In one bench, the seeds were sown in rows and later the plants were thinned out for proper separation. In the other bench, the seedlings pricked out from flats were planted. All seeds were sown on the same day. Soil and other factors were identical in both benches. The direct sowing showed superior growth, bloomed ten to fourteen days earlier, and with bloom spikes about twice the average length of those from the pricked out plants.

It appears that the root damage caused by transplanting, so interfered with absorption as to produce, among other things, a low nitrate to carbohydrate ratio. It probably required ten to fourteen days for the plants to recover from this traumatic shock and imbalance. This damage,

however, was reflected in the quality of the blooms toward the end of the plant's life-cycle.

In a limited discussion, one cannot consider all the factors involved in a chemical balance in plants. For optimum growth, phosphorus sulphur, calcium, magnesium, iron and potassium are essential in the plant's metabolism. The trace elements such as boron, silicon, copper, chlorine, zinc and manganese are also of vital importance. In their absence the signs of deficiencies are quick to appear. A soil that is chemically balanced for the average crop of plants, may show deficiency for special varieties. Stocks (*Mathiola incana*) are very sensitive to potash deficiency. Their lower leaves turn yellow and die, and later the upper leaves show the same pathology, starting at the tips and progressing toward the petioles. Accessory potash feeding, in addition to balanced fertilizers, are usually necessary to keep this type of plant healthy.

For the gardener it is helpful to remember a few of the basic associations between the elements and the plant functions; such as the dominant association of nitrogen with top growth; phosphorus with root growth; potassium with carbohydrate (sugar, starch) production. Plants growing in soils with high available phosphorus show vigorous root growth; whereas plants in a high nitrogen medium, develop roots definitely smaller than similar plants grown with balanced fertilizers. In drought, this abnormal root to shoot relation would present considerable hazard.

The early recognition of the signs of deficiency is extremely important. Prime production is impossible without perfect balance. Deficiencies due to trace elements, although very serious, require but a trivial absorption of their salts to correct the defect. When soil conditions make them unavailable, the soluble salts of iron, manganese or other trace elements, in dilute aqueous solution sprayed on the foliage, will cure the malady. Although absorption by foliage is only slight, it is often adequate for trace element compounds.

In animal or plant life, serious diseases may be caused by the trifling absence of trace elements. In fertile Florida, cattle were starving in green pastures due to such trace element deficiencies as copper, iron and cobalt. Citrus-malnutrition was solved by use of compounds of copper, zinc, manganese, magnesium and iron. The proper use of these compounds has brought progress and economic strength to large communities. Other quantitatively lesser substances as vitamins, enzymes, hormones and antibiotics are progressively assuming greater biochemical significance.

With the approach of autumn the soil nitrogen shows a decrease, and its ratio to carbohydrate is such that the plant stores food. This procedure is beneficial in the hardening process of perennials and also supplies energy for the spring growth. The application of a high nitrogenous fertilizer at this time would disturb a normal balance by stimulating vegetative growth which will easily be killed by frost, and by consuming the stored food that was reserved for spring growth.

A healthy plant would indicate proper nutrient ratio. A phosphorus deficiency would produce a poor root growth and, even if there were an

abundance of nitrogen in the soil, the plant would still suffer from nitrogen deficiency because of its restricted absorptive mechanism. Ample nitrogen and phosphorus may produce vigorous vegetative and root growth but, if potash is deficient, the carbohydrate mechanism cannot properly function and the plant will soon be in distress. The biological functions are so interwoven and interdependent that any one deficiency may initiate a chain reaction of pathological events.

Even in the balanced presence of all material substances essential for plant life, adverse environmental factors such as cold or diminished light would be detrimental. Regardless how abundant the raw products may be, the plant cannot manufacture sufficient food with inadequate light. Water may be plentiful, but if the ground is cold, the absorption is slow. These are some of the reasons why, in northern greenhouses, winter-grown plants are decidedly smaller than the same species grown in the warm, sunny spring. Cold-grown snapdragons often wilt with the sudden appearance of bright sun. The air which is quickly warmed, promotes a transpiration more rapid than the absorption by the roots in the cold soil.

There are many factors involved in optimum growth. Unchecked rapid plant development provides maximum production in a minimum of time. Such procedures have been emphasized by DR. POST at Cornell. Large *Geranium* cuttings with all their leaves intact may be rooted and later potted with the production of large plants in a period of five to six weeks. The older methods required as many months. These procedures are not only botanically interesting, but also are economically important to commercial growers. With *Chrysanthemums*, short soft tip cuttings from vigorous stock plants are preferable. If sterilized sand is the rooting medium, several half-strength applications of a balanced liquid fertilizer should be applied. On soft green stems there will be no bud suppression when the plants are pinched. Cuttings should be taken from the sand or other rooting media when the roots are short (about $\frac{1}{4}$ inch). Planting at this time may be done with a minimum of root damage. Long-rooted cuttings with woody growth start the plants with a handicap from which there can be no complete recovery.

A rapid balanced growth indicates plant vigour; it is associated with optimum climatic and edaphic factors; it takes advantage of the natural growth cycles. A *Fuchsia* plant in the late fall may have fine foliage and blooms, but at this time is dormant as far as new vegetative growth is concerned. Cuttings at this stage will not root, but will do so as soon as the plant shows signs of new growth.

Under cultivation, in greenhouses and with house plants, there is a tendency for the soluble salts to approach toxic levels of concentration. Too liberal fertilizer applications and the use of the same soil for long periods aggravate this condition. As most of our common plants are mesophytes, they are intolerant of conditions approaching a xerophytic medium. As the osmotic tension of the soil-water increases, the plant's suction power becomes inadequate and wilting occurs, particularly so on sunny days. Under such conditions the plant's life is a precarious one; normal metabolism is impossible. Slight adjustments within physiological ranges probably take place, but for optimum growth this

condition must be corrected. The remedy, both for pot plants or bench grown crops, is copious leaching.

In nature, the mineral salts brought to the surface by evaporation are washed back in the soil by rain which is practically distilled water. Tap-water contains salts in solution, but the loss by percolation will be many times that which was added by leaching, and the soil can be restored to its proper tension level.

Soluble salts in soil solution ionize and are good conductors of electricity. By use of the Solu-Bridge conductivity apparatus, the percentage of soluble salts in a soil extract can be accurately determined. The specific conductance or K value is read in terms of microhms $\times 10^{-16}$ at 25° C. A specific conductance (K) of 100 approaches toxic levels of concentration and this corresponds approximately to 0.5 per cent. of salts in solution. Tap-water in our greenhouses has an average K value of 25. K values of 75 and less are desirable for most crops. This phase of chemical imbalance, when recognized, can easily be corrected, and soils that are toxic because of this condition can be normally restored.

In our greenhouse experience, the most vigorous growth takes place when the soil-water is in its most available form, and this occurs when its tension is at zero or slightly above, as indicated by tensiometer readings. At these tensions wilting will not occur. Plants subjected to frequent wilting will not produce blooms of prime quality. At the wilting stage the stomata of the leaves are closed and the carbon dioxide intake essential in photosynthesis is practically cut off. Although the sun may shine on a plant in such condition, it cannot manufacture food. The plant's condition may be poor in a soil that is rich with products that are unavailable.

I have elsewhere (2) discussed the significance of soil reactions. The pH or soil reaction plays a predominant role. Most plants thrive in the pH range extending from about 5.6 to 6.5. The pH of 7 indicates a neutral reaction and readings above 7 show alkalinity. It is in the slightly acid range that the maximum solubility of salts takes place and thus become available. At higher and lower pH ranges, nutrient salts may become locked into insoluble compounds, or soluble toxic salts may be produced. Hydrangeas, Azaleas and Rhododendrons have need for considerable iron, and as iron salts are only soluble in an acid medium, a pH of about 4.5 is best suited for their needs. These acid-requiring plants are sensitive to iron deficiency and quickly show a chlorosis when this element is lacking. At low pH values toxic soluble aluminium salts may be present. The aluminium salts are only toxic to plants growing in the medium pH range. Plants in the lower acid scale have adapted themselves to this toxic salt and may possibly use it in their economy.

Soil reactions and temperatures may vary or intensify colours. Chrysanthemums blooming in the late summer are not as intense in colour as the same variety blooming in the late autumn. The high night summer temperatures accelerate the plants' respiration with considerable consumption of the sugars. The cooler nights of the autumn allow the storage of sugar which enters into the synthesis of the anthocyanin pigments which chemically are glucosides. High night temperature is an extravagance that most plants cannot afford and they soon become

physiologically impoverished when grown in such a manner. In natural growth, the low temperatures are at night when the least amount of food is consumed in respiration, at a time when it cannot be manufactured.

The water-soluble plant pigments vary their colour with the plant sap reactions. Anthocyanins in acid medium become red; in an alkaline medium they are blue. Growing plants in the pH best suited for them will improve their colour. Hydrangeas require the presence of aluminium for blue coloration and the salts of this metal become available in the acid range. At a pH of 5.5 a clear blue will develop. With a scarcity or absence of soluble aluminium salts, the flowers are pink. White hydrangea blooms are indifferent to soil reactions, because the white in the petals, as it is in grey hair, is due to a colloidal dispersion of air bubbles in the tissues with its characteristic white light reflection. The response of foliage plants is more colourful when grown at the pH best suited for them. It is not my purpose to discuss here in detail the colours of vegetation but merely to point out that the contributing factors may be chemical and physical.

Spraying, dusting and the use of aerosols are not within the scope of this article. Their regular use is extremely important to the health of plants.

For the utmost in form and colour, time-pinching and disbudding are essential in the growth of pompon Chrysanthemums. Uncontrolled culture frequently results in a profusion of growth with few small blooms on many elongated slender branches. This is poor material for floral arrangements. Our objective in time-pinching is to allow only three main branches to grow, each to produce a full and symmetrical spray of choice blooms. The time of pinching is very important and will vary with the variety of the Chrysanthemum. Unless the date for the variety is correct, the harmony and beauty of the spray will be lost. If the pinching is done too early, the laterals on the main branches will grow too long before setting bud. This short-day plant cannot initiate bud formation until the proper photoperiod or day length has been reached.

A well-grown greenhouse Chrysanthemum plant should be eight or more inches tall when ready for pinching. Allow only three main stalks to develop and keep these well-trimmed. When the distal bud on each stalk is definitely set, it should be removed. If allowed to remain, this bud produces a large bloom that is well past its peak at cutting time or is concealed by the lateral blooms later on. Disbud so that each of the three sprays will have about six blooms. When the plants are about 18 inches high, the leaves on the lower thirds should be removed. This provides better ventilation, more light, and facilitates watering and cultivating. These procedures place the plants in the high nitrogen to carbon ratio essential for select foliage and bloom production. So striking is the improvement over uncontrolled growth, that, at times, it is difficult to believe we are dealing with the same variety. Chrysanthemums are short-day plants; they can be forced into bloom earlier by shading with dark cloth during the long days, or their blooming period may be delayed by increasing the day length during short days, with electric lights. The combined use of these systems make it possible to grow Chrysanthemums the year round.

Plant behaviour under cultivation represents its responses to our treatments. These reactions are very flexible, but reach their maximum of quality in the absence of limiting factors.

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VIOLAS

J. Wilson

HISTORY shows that from time to time once-popular flowers have a habit of falling into disfavour, or being forgotten for the time being. Fuchsias are a case in point, but quite recently interest in this flower was revived.

The Viola is another plant, once very popular, which now one rarely encounters massed in the way it should be to be effective.

There are few flowers which are capable of lasting over so long a period as the Viola, especially those flowering during late Spring and through the Summer months. This easily managed plant is attractive when grown by itself or used in combination with other subjects, planted in separate colours, or mixed.

It is happiest with partial shade, especially during the hottest part of the day, and to keep up a continuity of bloom it should be given generous soil treatment and never be allowed to suffer from the effects of drought. There is one other condition which it demands, namely the removal of all dead flowers at not more than weekly intervals.

It can be grown as a ground cover for many of the commoner Lilies, and the mauve varieties are effective growing in conjunction with Roses.

Where similar conditions exist Violas can be used effectively as shown in the photograph (Fig. 203), the borders in question being approximately 100 yards in length giving the appearance of a living patchwork quilt.

With the aid of a cold frame it is possible to grow this flower successfully, and to obtain the best results it should be treated as an annual.

Cultural requirements are simple:—

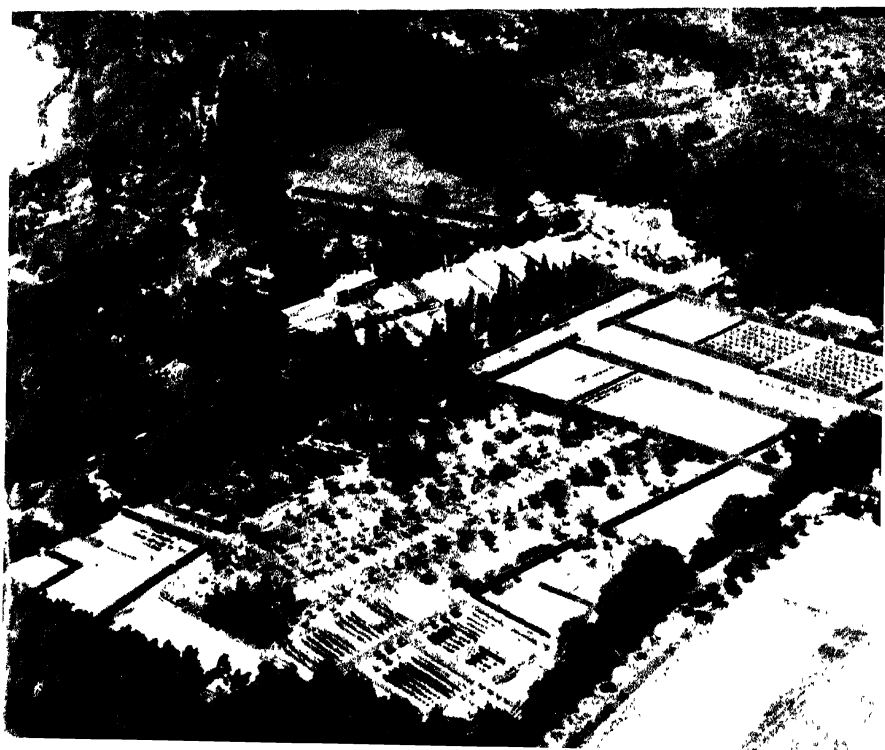
When the plants show signs of exhaustion during August, flowering shoots should be cut back to within about 3 inches of the crown, which will have the effect of encouraging the plants to produce a number of young shoots from the centre which prove ideal cuttings, these should be taken from time to time as they reach the correct stage during the months of September and October.

Prepare the cuttings in the orthodox manner and insert in a cold frame containing a sandy compost, placing these about 3 inches apart in each direction. Keep the frame closed and provide shade when necessary until the cuttings are rooted, after which they should be



Photos: Aero Pictorial Ltd

Figs 194, 195- The R.H.S. Gardens, Wisley, from the air





Photo, G. Darby



Photo, J.E. Downward

HYBRID LILIES

Fig. 196—(top) *Lilium parvum* × *L. Parryi* raised by the late DR. F. STOKER

Fig. 197—(bottom) *Lilium* 'Bridesmaid' A.M. July 12, 1950 (*L. nevadense* × *L. Parryi*)
raised at Maidwell Hall. (See p. 384)

Photo G. Darby



HYBRID LILIES RAISED AT MAIDWELL HALL

Fig. 198—*Lilium* 'Shuksan' \times *L.* 'Burbankii.' Some of these are 7 ft. high and carry
 100 flowers to a stem. They have been grown in less than three years.



Photos, F. L. Skinner and

NEW HYBRID LILIES

Fig. 199. *Lilium* 'Dunkirk' A.M. June 27, 1950, growing at Wisley. Raised by MR. F. L. SKINNER, of Manitoba, Canada. (See p. 416)



LILIES AT WISLEY

Fig. 200 - *Lilium giganteum* in the woodland garden



SHOW AURICULAS

Fig. 201 -- Seedling white-edged Show Auricula flowering for the first time
(See p. 388)



SHOW AURICULAS

Fig. 202. Alpine Auriculas (right) 'Lady Daresbury,' a flowering offset (left) A seedling, first flowers on young plant (See p. 388)



Photo, Malby

Fig. 203—Borders of Violas at Trent Park (See p. 396)

Fig. 204. *Nepeta Faassoni*
Bernans (from a drawing by
A. J. WIST.) (See p. 424)



Fig. 204



Fig. 205

Fig. 205. *Nepeta Mussoni* Sprengel
[from J. J. ROSENBAUM, *Iconographia*
Botanica 2, 1: 587-18: 81] (See p. 403)

Fig. 205. *Nepeta Mussoni* Sprengel



Fig. 206. *Yucca radiosa*. A fine Yucca from La Mortola. (See p. 308)

RHODODENDRON AWARDS.

1950

Fig. 207.—Rhododendron 'Conroy'
A.M. May 23, 1950 (*R. cinnaba-
rium* var *Roylei* *R. concinnum*)
Exhibited by LORD ABERCONWAY
and the National Trust (See p. 410)

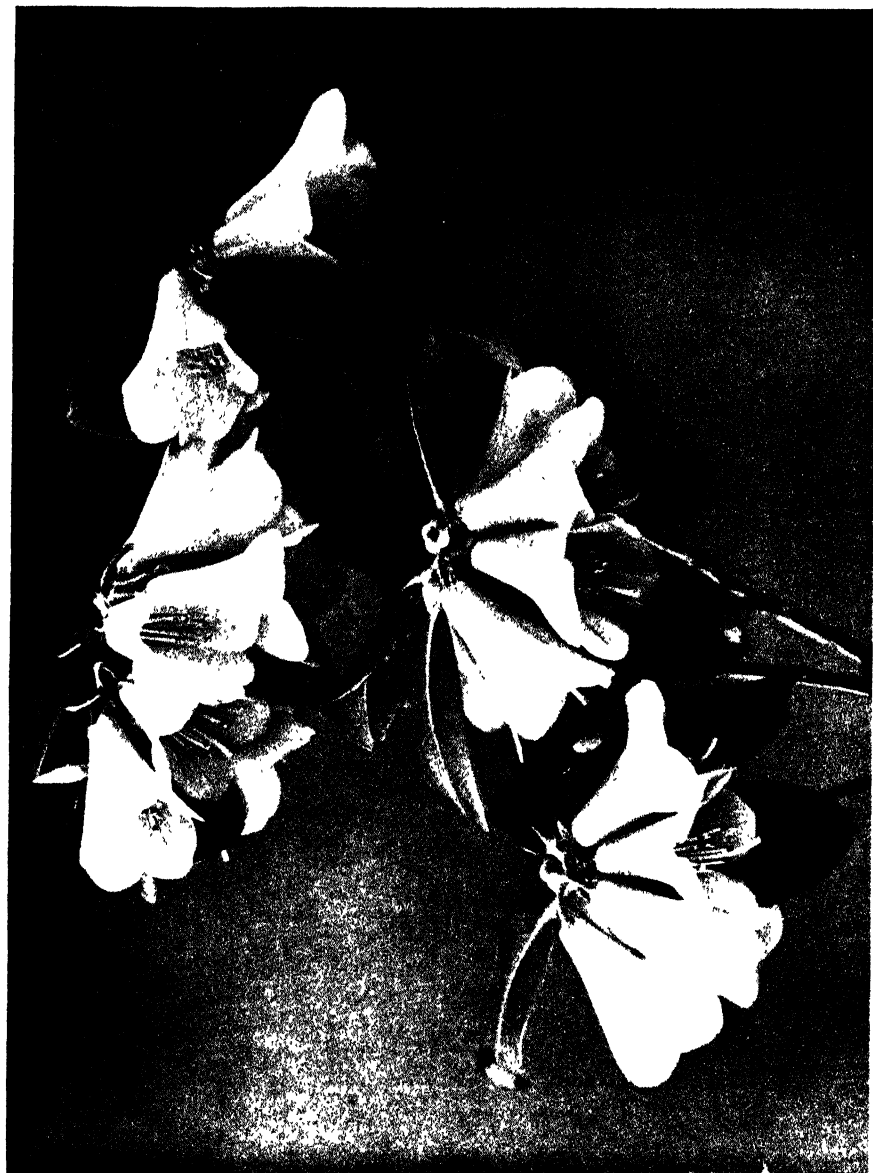


Photo. J. E. D. & W. A. I.

RHODODENDRON AWARDS,
1950

Fig. 208 — Rhododendron 'Wingsome' A.M. May 23, 1950 (*R. 'Humming Bird'* R. *Gibsoniana*). Exhibited by LORD ABLE ON-
WAY and the National Trust (See
p. 412)





Photo T. F. Downward

Fig. 206—*Rosa spinosissima* 'Frühlingsgold' **A.M.** May 23, 1950 (See p. 413)
Exhibited by MESSRS. T. HILLING & CO., Chobham

ROSE AWARDS

Fig. 210—*Rosa anemonoides* 'Ramona' **A.M.** May 23, 1950 (See p. 412)
Exhibited by MESSRS. T. HILLING & CO., Chobham

Photo, Ablett



given an abundance of air at all times whenever weather conditions permit.

No further treatment is necessary beyond ventilating the frame during the Winter. During spells of extreme frost it will be necessary to afford some form of protection.

Very little water will be required during the Winter months, and when this proves necessary suitable weather conditions should be chosen for this operation (absence of frost, but with light sunny conditions prevailing).

During March (normal weather conditions prevailing) harden the plants with the object of transferring these to their flowering quarters towards the end of the month, placing them about 9 inches apart.

Subsequent treatment consists in removing all flowers for about a month until the plants become well established; should the season prove abnormally dry, give copious waterings.

With the weekly removal of all dead flowers, water when required, an occasional dressing of dried blood and the control of pests and diseases the plants will repay with an abundance of bloom over a very long period.

Habit varies somewhat, some varieties incline to become straggly with age, whereas others retain a compact habit. The size of the flower ranges from very large in the case of 'Moseley Perfection' down to comparatively small ones in the variety 'Jackanapes.'

Fortunately the colour range in *Violas* is wide, ranging from white to deepest purple.

'Swan' and 'Peacefold' are amongst the best whites, while 'Bridal Morn,' 'Newton Mauve,' and 'Maggie Mott' represent the various shades of mauve. 'Pickering Blue' is possibly the best of this colour with 'Admiration' a good deep purple.

'Primrose Dame' is lemon whereas 'Moseley Perfection' is a deep rich yellow. 'Kathleen,' white ground edged rose, is another very distinctive variety.

Aphids are the most serious pest of the *Viola*, and may be kept in check with a timely and routine application of a contact wash, e.g. Nicotine-soap or Nicotine Substitute (HETP or 'Mortopal').

Care should be taken to wet the underside of the leaves as far as possible to ensure that the insects are wetted by the insecticide.

Unfortunately *Violas* are subject to a Pythium which accounts for the plants dying at ground level. Watering the ground with Cheshunt Compound is advised in this instance.

NOTES FROM FELLOWS

A Simple method for Propagating Camellias

WITH ordinary care the propagation of most "japonica" *Camellias* from leaf cuttings presents no difficulties. But if it is desired to expedite their rooting and to reduce labour to an absolute minimum the writer can recommend the method described below. From your local shop, if you can persuade the owner to sell it to you, buy a large-mouthed glass sweet jar (it is essential that the opening be big enough to admit

one's hand). Having acquired this vessel first place a layer of charcoal at the bottom and then more than half fill it with a mixture composed of equal parts of finely chopped green sphagnum moss and coarse silver sand. On the top of this scatter a few more pieces of charcoal, the idea being that this will absorb any excess of carbonic acid gas that may be liberated by the cuttings. The whole contents should then be thoroughly moistened but not water-logged. The Camellia leaf-cuttings can now be inserted in the ordinary way. When this has been done the stopper is replaced which will cause the jar to be hermetically sealed. The only fresh air subsequently admitted will be that which enters accidentally when the cultivator's curiosity prompts him to see how the cuttings are progressing. The writer shades externally (on one side only) the upper unfilled portion of the glass jar but allows sunlight to fall unimpeded on the lower part containing the rooting medium: the jar is then placed on a sunny bench in an unheated greenhouse and thereafter is given no attention.

Some of the leaf-cuttings of the hybrid Camellia 'Donation' taken in June and treated in this manner had rooted and were ready for potting by the fifth week: the others had all calloused and were just forming roots.

Benenden, Kent.

COLLINGWOOD INGRAM

Some Notes from the Hanbury Gardens, La Mortola, Ventimiglia, Italy

Yucca radiosa, a tree about 60 years old, has never before had more than two flowering heads. Its habit of clustering its bell-like flowers, forming great roses unlike most members of the family, make it singularly beautiful. (Fig. 206.)

Romneya Coulteri var. *tricalyx* has done magnificently this year owing to heavy manuring. It is over 8 feet in height.

Erythrina Crista-galli is in full flower and is a most attractive tree-shrub, very useful for picking, though not so decorative as *E. insignis*, of which our big tree, over 50 feet high, was destroyed by shelling.

There is not much in flower now, except masses of *Bougainvillea*, copper, flame, deep purple and the common one. Next year I hope to flower three new varieties brought me from Jamaica by my brother, Captain Symons-Jeune.

Geraniums of all colours are in full bloom, but too common, however lovely, to mention in your pages! The lovely *Cassia coquimbensis* is out in golden clusters, as well as blue Jackerandas and the tall tree *Grevillea robusta*, and *Albizzia julibrissin*.

DOROTHY HANBURY

Growing Gentiana verna in very dry districts

Instructions for growing plants that are not entirely easy are of little use unless the exact locality is known, as conditions throughout the country vary enormously.

My garden is on the top of a very dry, well-drained, limestone hill and the annual rainfall is about 21 to 22 inches. After some unsuccessful attempts at retaining sufficient moisture for such plants as *Gentiana*

verna, I took a large zinc bath about 2 feet deep, sealed up the plug hole entirely and sunk it in the rock garden. The bath was filled with a very rich mixture of rotted compost, manure, peat, loam and sharp sand and the top few inches at one end with a mixture of about equal parts of sharp sand and peaty soil. This was well soaked and some plants of *Gentiana verna*, previously raised from seed were put into it.

These have flourished here without any trouble and without watering for three years. Other plants in this bath, which are flourishing, include *Nomocharis pardanithina*, *Iris Kaempferi*, some bog Primulas and *Iris lacustris*.

J. CLUTTON-BROCK, M.A., M.B.

Lincoln.

PUYA ALPESTRIS IN ITS NATIVE LAND

W. Balfour Gourlay

CHILE, as we all know, is a country that has given us many magnificent flowering trees and shrubs, as well as plants for the herbaceous border and cool greenhouse: e.g. *Eucryphia*, *Crinodendron* and *Embothrium* among the first group; *Salpiglossis*, *Alstroemeria*, *Calceolaria*, *Alonsoa* and *Schizanthus* among the second and third. Being a succulent xerophyte, *Puya alpestris* may be classified as a large rock plant.

For recent descriptions of the plant in cultivation, with beautiful illustrations, one should turn to Chapter VII of P. M. SYNGE's *Plants with Personality* and to LIEUT.-COL. C. H. GREY's Fellow's Note in the September 1949 number of this JOURNAL, under the heading *Puya Whytei* (*P. alpestris*, however, being the older name, is preferred to that of *P. Whytei** in accordance with the Vienna Rule).

Before considering *Puya alpestris* in its native land, we must understand something of the remarkable climatic conditions that prevail in that country. Chile, though only from 100 to 250 miles broad from West to East, is as much as 2,700 miles long from South to North. Up along this coast, from Antarctic regions, sweeps the cold Humboldt current right up to or beyond the Equator, with the result that N. Chile and much of Peru are rainless, the sea being colder than the land, thus preventing precipitation as rain. About Tierra del Fuego (Lat. 52–55° S.) the wind blows continuously from the West and the rainfall is anything up to 300 inches *per annum* on the West side of the mountains, and decreases continuously from South to North in association with a gradual counter-clockwise change in the direction of the prevailing winds. Thus at Ancud (Island of Chiloé, Lat. 42° S.) the rainfall is about 200 inches, but only about 10–20 at Valparaiso (Lat. 33° S.) where the prevailing wind is from the South. North of this the wind tends to blow from the land. However, about Coquimbo (Lat. 30° S.), with only 2 or 3 inches of rain *per annum*, the coastal hills are surprisingly green, in early summer at any rate. This is due to fog banks which occur when the warm air from the land comes in contact with the cold sea-water, which fog-laden air is sucked back over the coastal hills with the sharp fall of

* *Puya alpestris* (Poepp. et Endl.) Gay (1853) which is based on *Pourretia alpestris* Poepp. et End. (1833). *P. Whytei* Hook fil. (1868).

temperature that usually occurs on land about sunset. The condensation of this moisture accounts for the unexpected verdure. Nor are the local plants all xerophytes. For example, the delicate little *Calceolaria picta* (Bot. Mag. T. 9312) grows in shady places under the drip from leaves of *Fuchsia* and other bushes.

Chile has been described as the Western slope of the Andes in their Southern portion; but this is an over-simplification, as the main Cordillera is separated from the lower Coast Range by the fertile Central Valley. But, owing to a process of submergence in some past epoch, the Coast Range in S. Chile has been broken up into a string of islands and the Central Valley had become a series of channels, much used to-day by small craft in an endeavour to escape from the rigours of the "Roaring Forties." From Cape Horn to Valdivia, in the fifties and forties, the hills are clad in dense forests of *Nothofagus spp.* (Southern Beech) with a few conifers. The Chilean Lake District lies at the lower end of the Central Valley, between Puerto Montt and Valdivia. Here the scenery is magnificent. These temperate Chilcan rain-forests have a tropical appearance, with many bamboos (*Chusquea spp.*) and the trees festooned with epiphytes and hanging lianes. Valparaiso (Lat. 33° S., Mean Temp. 60° F.) has a long dry summer with some 10–20 inches of rain in winter. The hills are covered with open scrub country with small trees and bushes and tall Cacti on sunny Southern slopes of the valleys. Vegetation gets scarcer North of Coquimbo (30° S.) until the rainless nitrate deserts of N. Chile are reached.

The family *Bromeliaceae* is represented in Chile by several genera, of which *Puya* is the most striking. Of these we* found *P. violacea* at Los Baños de Cauquenes only, *P. alpestris* there and also at Coquimbo, and *P. chilensis* in various places. A few rare and local species, including *P. coerulea*, we did not see. *P. chilensis* and *P. alpestris* (vel *P. Whytei*) are nearly related; and though both occupy a wide range from North to South in Central Chile, *P. chilensis* is the commoner of the two. The flowers of *P. chilensis* are of a slightly greenish-yellow, while those of *P. alpestris* are of a quite sensational malachite blue-green. The leaves of the latter species are more glaucous and decumbent than those of *P. chilensis*. The branches of these great rock plants are often from six to ten feet high, the stems and branches ending in tufts of leathery leaves, edged with narrow spines. One or more great compound flower spikes rise vertically from the ends of stems and branches, as high again as the rest of the plants. The flowers of both species contain sweet nectar in great abundance, presumably to supply the needs of humming-birds rather than insects. The flowers of both species are crowded together on the first few inches of the spikelets, a foot or more of their distal ends being clad only with sterile bracts suggesting their use as bird perches. Though humming-birds usually hover while sucking nectar, some species will take advantage of twigs, if conveniently placed for their purpose. (H. O. WAGNER† shows a picture of Heloise's Humming-bird perching on a

* Mr. Clarence Elliott and I.

† H. O. Wagner, "Food and Feeding Habits of Mexican Humming-birds." *Wilson's Bulletin*, Vol. 58, No. 2, fig. 1.

twig of *Erythrina americana* while sucking nectar from flowers.) Though humming-birds show a preference for red tubular flowers, which (like the little birds themselves) are abundant in all American countries, they also visit flowers of other colours where these are large and conspicuous as in *Datura*, or occur in large and conspicuous inflorescences as in *Puya* and *Agave*.

The remains of leaves of previous years persist as a black scaly covering to old stems and branches, giving them a burned appearance. This has given rise to the strange but widely held notion that the plants are subject to spontaneous combustion! The stems of old plants, especially where growing on steep rocks, are much contorted and resemble writhing snakes.

MR. CLARENCE ELLIOTT and I spent portions of the years 1927 to 1930 collecting plants in Chile. Unfortunately, when we first encountered *Puya alpestris* we were wrongly informed that it was *P. coerulea*, a name which fitted it well, but rightly belongs to a rare or local species which we never saw.

Travelling gradually southwards, we came to Concepcion (Lat. 36° 50' S.) and there we suddenly walked into a group of blue-green flowered *Puyas* in full flower, growing in a climate with abundant rainfall, yet in every way similar, except in size, to the plants we had seen in the much dryer northern regions. For this little group of plants, all growing within 100 yards of each other, were no more than 4 or 5 feet high, including the flower spikes! We concluded that they must belong to a dwarf variety of their more Northern relatives, or to a nearly related species. ELLIOT promptly gave them the provisional name of *P. coerulea pygma*.

It was not till rooted layers had been brought home, and a flowering spike shown at Chelsea in 1936, where it received a well deserved Award of Merit, that we first heard the name *Puya alpestris*. So it was a disappointment to discover later that *Puya alpestris* was not, as we supposed, a new introduction to this country. It was in 1864 that MESSRS. VEITCH introduced it from Chile through the agency of a MR. MARK WHYTE, after whom it was called *Puya Whytei* in 1868, evidently in ignorance of the fact that a full description of the plant, under the name *Puya alpestris*, is given in Vol. VI of the botanical portion of CLAUDIO GAY's *Historia fisica y politica de Chile*, published in Paris in 1853. The plant was figured in *Bot. Mag. T.* 5732 in 1868; but the artist failed entirely to capture the strangely fascinating but elusive blue-green of the flowers. MR. J. TYERMAN grew it at Tregony in Cornwall and flowered it in 1881 in a sunny dry spot (*Gard. Chron.* Oct. 1, 1881).

A striking point about many Chilean plants is the length of their area of distribution from North to South, so that their various members experience a remarkable range of climatic conditions. To obtain hardy types it is necessary to obtain specimens or seed from as far South as possible. *Embothrium coccineum* is a case in point. The distribution of *Puya alpestris* is given as from La Serena (Lat. 30° S.) to the Bio-Bio River (Lat. 37.45° S.). Thus our recent introduction was collected near the extreme South end of the range of the species. So, though we cannot be certain that the plants were not immature and therefore small, we

can be certain of their maximum hardiness, as proved by the flowering of LT.-COL. GREY's plant in the open at Malton in East Yorkshire. But few Chilean plants will stand one of our colder winters without some protection.

During my first short visit to Chile in 1908, my friend DR. EDWIN P. REED, of Valparaiso, a physician and amateur entomologist, showed me the immense caterpillars (over four inches long) of a moth which lays its eggs on the stems of *Puya chilensis* and *P. alpestris*. The former species is most frequently attacked, probably because it is the commoner one of the two. On hatching, the caterpillars tunnel the stems. Later the pupæ make long cocoons on the outside of the stems, in which they can be heard running up and down when disturbed. The cocoons may be as much as ten inches long. None of the moths were hatched out at the time of my visit. A paper by DR. REED about this remarkable insect (*Castnia eudesmia* Gray)* has come into my hands. The moth is brightly coloured and flies by day, and is said to drive away other insects and even humming-birds from the *Puya* plants. DR. REED mentions that he has seen the great moths dusted with *Puya* pollen; so they, like the humming-birds, may take a hand (or some part of their anatomy) in pollinating the flowers. The female insects are considerably larger than the males.

N.B.—DR. REED's father (DR. EDWIN C. REED) was one of the few people who found, growing wild in Chile—in the sixties of last century—that rare and beautiful plant *Tecophilaea cyanocrocus* (see *Bot. Mag.* T. 8987).

Seven species of *Castnia* have been recorded from Brazil; and among the plants whose stems are attacked by their caterpillars are bananas, sugar cane and various Bromeliads and Orchids.

In the North Gallery at Kew, among MARIANNE NORTH's flower pictures from all over the world, No. 25 ("Blue *Puya* and Moths") was painted at Apoquindo, near Santiago, in the autumn of 1884. It shows a large plant of *Puya alpestris* (vel *P. Whytei*) with some of these brightly coloured moths (*Castnia eudesmia*), and one of the cocoons attached to a stem. It is to be hoped that the North Gallery will again be opened to the public without undue delay.

CLARENCE ELLIOTT found by experience at Stevenage that, in the absence of humming-birds, artificial cross-pollination is necessary to obtain *Puya* seed; and the exchange must be between flowers from different plants, as *Puya alpestris* is self-sterile. This is not always easy, even for owners of two or more plants, as the latter may not flower at the same time.

If anyone possessing plants of *Puya alpestris* about to flower cares to write to me at 7 Millington Road, Cambridge, giving me his or her name and address, I will do my best to put them in touch with others in the same position. Mature flowers, emptied of their nectar and sent by post in a carefully padded tin, should arrive, with any luck, with still viable pollen. It would be a misfortune were this splendid plant to die out of cultivation again, especially in its most Southern and hardy form.

* '*La Castnia eudesmia*, Gray,' by Dr. Edwin P. Reed. *Revista Chilena de Historia Natural*, Año xxxviii (1934), pp. 267-271.

NEPETA MUSSINII AND $N. \times$ FAASSENII

William T. Stearn

ABOUT 1802 a Russian count, APOLLOS APOLLOSOVICH MUSSIN-PUSHKIN, made an expedition to the Caucasus. Little is known about him or his travels, which may have been in search of minerals, for he was a chemist and physicist, but he certainly collected specimens of Caucasian plants, and among them were several new species. Accordingly, in 1805, the year of his death, a compatriot, J. M. F. ADAMS, named a new genus of liliaceous bulbous plants Puschkinia in his honour, this being typified by the now well-known *P. scilloides*. Another plant which commemorates MUSSIN-PUSHKIN is a Catmint, *Nepeta Mussinii*. This was dedicated to him by a German professor, KURT SPRENGEL (1766–1833), but the original description, based on a Caucasian plant grown in the Halle botanic garden, was published by SPRENGEL's pupil, COUNT LEO VICTOR FELIX HENCKEL VON DONNERSMARK (1785–1861), in a slim quarto work entitled *Adumbrationes Plantarum nonnullarum Horti Halensis Academici* (24 pages; Halae, 1806). Study of his detailed description removes all doubt as to the identity of the original *N. Mussinii*. It was introduced into English gardens about 1802 or 1803 and figured in the *Botanical Magazine*, 23, t. 923 (April 1806), as *N. longiflora* (non Ventenat). Another figure of *N. Mussinii* (Fig. 205) was published by REICHENBACH in his *Iconographia Critica*, 6, no. 806, t. 587 (1828). Both illustrations portray a low-growing plant with heart-shaped leaves and a short inflorescence, very different in general appearance from the plant commonly grown in British gardens to-day as *N. Mussinii*. They agree, moreover, with HENCKEL's description of his *N. Mussinii*, and a plant of the same character is still to be found in British gardens. There are, in short, two plants now cultivated as *N. Mussinii* and the one generally known under this name in British gardens is not *N. Mussinii* at all. They may be readily distinguished by their leaves. In the true *N. Mussinii*, a native of the Caucasus and Persia, the leaves are ovate to broadly ovate (length to breadth often about 3 to 2) with a cordate base, up to 2.1 cm. broad. In the false *N. Mussinii* (i.e. *N. Faassenii*) the leaves are lanceolate to narrowly ovate (length to breadth often almost 3 to 1) with an almost truncate base. This misapplication of the name *N. Mussinii* became evident fifteen years ago* and the writer accordingly tried to ascertain the identity of the popular garden plant, commonly though wrongly known in England as *N. Mussinii*, by means of a cursory survey of botanical literature relating to *Nepeta*, and of specimens in the Kew, Berlin and Weimar herbaria. The only herbarium specimens which exactly matched it were from cultivated plants; there seemed no wild species with which it could satisfactorily be identified and no published name whereby it could be designated as distinct from the true *N. Mussinii*. Hence the plant either belonged to a species rare in nature or was of garden origin. It appeared to be unnamed. The genus *Nepeta* includes, however, about 150 or more species, upon which botanists have bestowed more than 390 names, and like so many other genera it stands greatly in need of critical revision.

* In 1921 JOHN FRASER pointed out in the *Gardener's Chronicle*, 70, 171 (Oct. 1921) that there were two forms in cultivation under the name *N. Mussinii*.

A detailed investigation ought to precede the publication of new names within the group. In these circumstances it seemed best to continue calling the garden plant "*N. Mussinii*" hort. non Sprengel, knowing full well that sooner or later it would have to receive another name. Since then two names have been given to it, JOHN BERGMANS naming it *N. × Faassenii* in a Dutch book on herbaceous plants in 1939 and ERNST VILHELM FLOTO naming it *N. × pseudomussinii* in a Danish horticultural journal in 1944. (Fig. 204.)

Nepeta Faassenii (syn. *N. pseudomussinii*) is always propagated vegetatively because it does not set seed. Examination of its pollen by FLOTO and his collaborator, GUDNI GUDJONSSON, revealed this to be completely sterile. Reduced fertility or complete sterility of the pollen often characterizes hybrid plants. Cytological study proved *N. Faassenii* to be triploid with $2n = 26$ chromosomes, whereas the related *N. Mussinii* having almost completely fertile pollen (about 96 per cent. fertile) is a diploid with $2n = 18$ chromosomes. These facts suggested that the triploid *N. Faassenii* might be a hybrid between the diploid *N. Mussinii* and a related tetraploid species, the most likely being *N. Nepetella*, which has $2n = 34$ chromosomes (probably derived from 36, the basic number in *Nepeta* being 9). This south European species is often cultivated in botanic gardens along with *N. Mussinii* and has lanceolate leaves. It grows up to 2 feet or so high and is of erect habit. In leaf-form and other characteristics the triploid *N. Faassenii* thus stands midway between the diploid *N. Mussinii* and tetraploid *N. Nepetella*, and there seems no reason to doubt that these are its parents. Further evidence is supplied by "the fact that one large chromosome, identical with that of *N. Nepetella*, is present in the root-tip plates." Of the 26 chromosomes of *N. Faassenii*, 17 are considered to be of *N. Nepetella* origin and 9 from *N. Mussinii*. For fuller particulars the detailed paper by FLOTO and GUDJONSSON in *Royal Veterinary and Agricultural College, Copenhagen, Yearbook (Kongel. vet. Landbohøjskole, København, Aarsskrift)* 1947, 31-39 (1947), should be consulted. In England L. F. LA COUR has confirmed the triploid nature of *N. Faassenii*.

It may be noted here that floral differences are associated with those in habit, leaf, fertility and chromosomes already mentioned. The flowers of *N. Faassenii* are slightly smaller and paler than those of *N. Mussinii* and have the anthers included instead of protruding.

The history of *N. Faassenii* is obscure. *N. Nepetella* was introduced into British gardens about 1760, *N. Mussinii* about 1803. Since then there must have been many opportunities for the two species to cross in Continental as well as in British botanic gardens. It is worth noting that BENTHAM, writing in 1834 about *N. grandiflora*, stated that "this plant is common in continental botanical gardens where it appears to have mixed with *N. Mussini* and produced a variety of hybrids, which have been published under various names, borrowed from most of the other species of this section; and, in general, less reliance is to be placed on the names of *Nepeta* in various herbaria and gardens than of almost any other genus of the order." (*Gen. Sp. Lab.* 481). FLOTO and GUDJONSSON state that in the Copenhagen Botanic Garden, where *N. Mussinii* and *N. Nepetella* are grown side by side, "several seedling

plants, resembling *N. pseudomussinii* to a very high degree and sterile as this plant, have been found. Their chromosome number is also 26." The Kew Herbarium possesses a specimen, grown sometime before 1876 under the name *N. caerulea* in the garden of EDWARD LEEDS, of Narcissus fame, which appears to represent this plant. That it had arisen by 1890 is shown by a detailed article on "*Nepeta Mussini*," by E. ANDRÉ in the French horticultural journal *Revue Horticole*, 1891, p. 300. This has a coloured plate depicting not the true *N. Mussinii* but the plant so commonly known under that name to-day, i.e. *N. Faassenii*; ANDRÉ remarked that it was rarely cultivated. Since then this Catmint has become a common edging plant in British gardens, esteemed both for its greyish-green foliage and its profuse spikes of lavender flowers. As a garden plant it is far superior to both its parents. In the genus *Heuchera* hybrids have superseded the parent species as plants for garden decoration. The hybrid *Anemone × hybrida* and its white sport 'Honorine Jobert' have become widely known under the name *A. japonica*, which belongs rightly to one of their parents, *A. hupehensis japonica*, now a scarce plant in cultivation. *Romneya × hybrida* (*R. Coulteri* × *R. trichocalyx*) is sometimes grown as *R. Coulteri*. This example given by *Nepeta × Faassenii* of a hybrid becoming widespread in gardens under the name of one of its parents is thus by no means a solitary one.

On a light well-drained soil and in a sunny position *N. Faassenii* is perfectly hardy in England and grows vigorously; it is an excellent plant for a dry-wall as well as for edging. On a heavy damp clay soil, however, it may perish during the winter. FLOTO and GUDJONSSON state that "in Denmark *N. pseudomussinii* is not hardy in all years, and in severe winters it will easily be damaged if not covered." Spring planting gives better results than autumn planting. It is debatable as to whether the old dead growths should be left untrimmed during the winter, indeed up to the middle of April, to protect the new shoots from frost. Cuttings of flowerless shoots about 3 inches long, taken in June or July and inserted in moist sand or sandy soil in a cold frame or under a bell-glass or a large glass jam-jar, root within a month and may be planted out in August or September. The statement in some books that *N. Mussinii* can be propagated by seed refers to the horticulturally less important true species and not to its showy profuse-flowering sterile descendant *N. Faassenii*. It was the latter which received in 1935 the R.H.S. Award of Garden Merit and which is described in R.H.S. JOURNAL, 67, 169, fig. 59 (1942) as *N. Mussinii*.

Since no Latin diagnosis accompanies the original Dutch description of *N. Faassenii* by BERGMANS, *Vaste Planten* 2nd. ed. 544 (1939) and the English description by LAWRENCE in *Gentes Herb.* 8, 64 (1949), the Danish description of *N. pseudomussinii* by FLOTO in *Gartner-Tidende*, 60, 450 (1944), and the English description by FLOTO and GUDJONSSON in *Yearbook Roy. Veterin. Agric. Coll. Copenhagen*, 1947, 33, one is provided here to validate the name in accordance with *Int. Rules Bot. Nomencl.* 3rd ed., art. 38 (1935):—

Nepeta × Faassenii Bergmans, hybrida hortensis nova; a *N. Mussinii*, quacum in hortis confusa est, foliis angustioribus lanceolatis vel anguste oblongo-ovatis basi fere truncatis (nec ovatis vel late ovatis basi distincte cordatis), a *N. Nepetella* habitu procumbente humiliore, ab ambabus sterilitate pollinis inter alia distinguitur. Specim. authent. in *Herb. Hort. Kew!* *Herb. Mus. Brit.!* *Herb. Mus. Paris!* *Herb. Bailey Hort.!*

FLOTO's original Danish description may be translated as follows:—

"Plant perennial, short-tomentose throughout, grey-green, profusely branched from the base and forming a dense mound 1 metre across, 40 to 50 cm. high. Stems slightly four-angled, prostrate or ascending, more or less strongly branched. Internodes 2 to 4, seldom 6 cm. long. Leaf-blades oblong-ovate, evenly tapering to the tip, coarsely serrate. Veins impressed on the upper side of the blade, elevated on the lower side. Length of blade varies from barely 1 cm. up to 3 cm. Petiole up to 1 cm. long but often less than 5 mm. long. Calyx 5 to 6 mm. long, narrowing towards the tip. Calyx-lobes 1-1.5 mm. long. Corolla-tube very slender, slightly bent, only a little longer than the calyx. The short-stalked almost sessile flowers, which are gathered together on terminal branched shoots, have a length of 7-8 mm. Colour red-violet with darker spots on the inside. Lip violet. The whole plant has an aromatic mint-like smell and is probably completely sterile. From the investigations of MR. GUDNI GUDJONSSON, M.Sc., it is evident that the plant does not form properly developed (i.e. fertile) pollen." (FLOTO, l.c., 1944.)

SUMMARY

Under the name *Nepeta Mussinii* two plants are widespread in gardens. One is the true *N. Mussinii*, a species native to the Caucasus, but this is neither so popular nor horticulturally so valuable as its hybrid descendant *N. × Faassenii*, a plant of garden origin unknown in a wild state. The distinguishing features of the two plants are stated above.

WISLEY TRIALS, 1950

RHODODENDRONS AT WISLEY, 1950

The following varieties of Rhododendrons were recommended for Awards after trial at Wisley, by the Rhododendron Trials Committee, who made their recommendations for awards on May 5 and May 31, 1950, as given below.

Rhododendron (Azalea) 'Addy Wery' (*malvatica* × 'Flame'). **A.M.** May 5, 1950.—Of compact, dwarf, very free flowering habit, evergreen, with one or two open funnel-shaped flowers in a truss. The corolla 1½ inch diameter, the five petals Blood Red (H.C.C. 820/2) on Orient Red (H.C.C. 819/2) with a dull orange-bronze flush. Raised and introduced by The Old Farm Nurseries, Boskoop, Holland, and sent by Messrs. M. P. Cooper & Son, Muirfield, Ferndown, Dorset.

Rhododendron (Azalea) 'Apple Blossom' (*Azuma Kagami*). **A.M.** May 5, 1950.—Of compact, dwarf, very free flowering habit, evergreen, with two or three open funnel-shaped flowers in a truss. The corolla 1½ inch diameter, the ten petals Neyron Rose (H.C.C. 623/2) with a small blotch of Phlox Pink (H.C.C. 625). Sent by the Knap Hill Nursery, Ltd., Woking, Surrey.

Rhododendron 'Dawn,' **A.M.** May 5, 1950.—Bush compact, very free flowering, carrying the trusses well above the foliage, with eight large open funnel-shaped flowers in a round, flat-topped truss. The corolla 4 inches diameter, 2½ inches long, margins somewhat reflexed, of good texture; colour white flushed Phlox Pink (H.C.C. 625/3); buds flushed Phlox Pink (H.C.C. 625/2). Sent by Messrs. Waterer, Sons, & Crisp, Ltd., Bagshot, Surrey.

Rhododendron (Azalea) 'Exquisita.' **A.M.** May 31, 1950.—Plant vigorous, forming a well-shaped, compact, free-flowering bush with deciduous light glossy green foliage. Flower trusses flat domed, 12 to 20 flowered. Flowers 2 inches long, 2½ inches diameter, long funnel-shaped, expanded,

creamy-white with a soft flush of Amber Yellow (H.C.C. 505/2), blotched Saffron Yellow (H.C.C. 7/1). Raised and sent by Messrs. W. C. Slocock, Ltd., Woking, Surrey.

Rhododendron (Azalea) 'Homebush.' A.M. May 31, 1950.—Plant vigorous, free flowering, forming an erect, graceful shaped bush, with deciduous, light green foliage. Flower trusses round, with 14 to 16 flowers. Flowers semi-double, open funnel-shaped, $1\frac{1}{4}$ inch diameter, $1\frac{1}{4}$ inches long, Neyron Rose (H.C.C. 623) on a base of Rose Madder (H.C.C. 23/1). Raised by Knap Hill Nursery, Ltd., Woking, Surrey, and sent by Messrs. W. C. Slocock, Ltd., Woking, Surrey.

Rhododendron (Azalea) 'Knap Hill Pink.' A.M. May 31, 1950.—Plant vigorous, very free flowering, forming a well-shaped bush, with deciduous light glossy green foliage. Flower trusses dome-shaped, 6 inches across, with 14 to 18 flowers. Flowers open funnel-shaped, almost flat, $2\frac{3}{4}$ inches diameter, five petals, Phlox Pink (H.C.C. 625/1) flushed Neyron Rose (H.C.C. 623/1) margins darker, blotched Saffron Yellow (H.C.C. 7/1). Raised and sent by Knap Hill Nursery, Ltd., Woking, Surrey.

Rhododendron (Azalea) 'Marion Merriman.' A.M. May 31, 1950.—Plant vigorous, forming a free-flowering, low, well-shaped bush, with deciduous light glossy green foliage. Flower trusses large, dome-shaped, 18 to 30 flowers per truss. Flowers flat, open, six petals, 3 inches diameter, Chrome Yellow (H.C.C. 605/1) flushed Indian Yellow (between H.C.C. 6/1 and 6/2) with a large Cadmium Orange (H.C.C. 8) blotch. Raised, sent and introduced by the Knap Hill Nursery, Ltd., Woking, Surrey.

Rhododendron 'Scandinavia' ('Hugh Koster' × 'Betty Wormald'). A.M. May 31, 1950.—Plant of bushy habit, free flowering. Flower trusses round to dome shaped, 14 to 18 flowered. Flowers $3\frac{1}{2}$ inches diameter, open funnel-shaped, Cardinal Red (H.C.C. 822) on a Rose Red (H.C.C. 724) base, with a black blotch. Raised, introduced and sent by Messrs. M. Koster & Sons, Boskoop, Holland.

Rhododendron 'Lavender Girl' (Fortunei × 'Lady Grey Egerton'). A.M. May 31, 1950.—Plant of compact, free flowering habit. Flower trusses dome-shaped, 16 to 20 flowered. Flowers open funnel-shaped, $3\frac{3}{4}$ inches diameter, at margins of petals Amaranth Rose (H.C.C. 530/2) passing to a paler shade at centre which is white. Raised, introduced and sent by Messrs. W. C. Slocock, Ltd., Goldsworth Nursery, Woking, Surrey.

Rhododendron (Azalea) 'Mustard.' A.M. May 31, 1950.—Plant of vigorous, free flowering habit, forming a well-shaped bush, with light glossy green deciduous foliage. Flower trusses flat dome-shaped, 9 or 10 flowered. Flowers flat open, 3 inches diameter, Indian Yellow (H.C.C. between 6/1 and 6/2) with a large blotch of Indian Yellow (H.C.C. 6). Raised, introduced and sent by Messrs. W. C. Slocock, Ltd., Goldsworth Nursery, Woking, Surrey.

SWEET PEAS AT WISLEY, 1950

One hundred and fifty-three unnamed seedlings of Sweet Peas were received at Wisley for trial in the autumn of 1949. They were sown—36 seeds of each variety—on October 11, 1949, under glass in seed boxes. On November 22, 1949, the seedlings were potted singly into large 60's sized pots and placed in cold frames for the winter months, and were given free air except during frosty weather. On March 20, 1950, twenty-four plants of each were planted in double rows, twelve grown disbudded as cordons, twelve allowed to grow naturally on sticks. All made good growth and were finally judged by the Joint Committee of the Royal Horticultural Society and

the National Sweet Pea Society on June 12, 1950, who made their recommendations for awards as given below.

FLOWERS WHITE

Albatross (raised, introduced and sent by Messrs. W. J. Unwin, Ltd., Histon, Cambs.). **H.C.** June 12, 1950.—Plant vigorous, flower stems stiff, 14 inches long, four flowered, well and regularly spaced; flowers $2\frac{1}{2}$ inches diameter, of good substance, white, sweetly scented.

FLOWERS PALE CREAM-PINK

Country Girl (raised, introduced and sent by Messrs. Carters Tested Seeds, Ltd., Raynes Park, London, S.W. 20). **A.M.** June 12, 1950.—Plant very vigorous, flower stems stiff, 13 to 14 inches long, four flowered, evenly and well spaced; flowers $2\frac{1}{2}$ inches diameter, opening Porcelain Rose (H.C.C. 620/2) on a cream ground flushed later with Carmine Rose (H.C.C. 621/1).

Maiden's Blush (raised, introduced and sent by Messrs. Carters Tested Seeds, Ltd., Raynes Park, London, S.W. 20). **H.C.** June 12, 1950.—Plant vigorous, flowers stems stiff, 13 inches long, four flowered, many fives, regularly spaced; flowers $2\frac{1}{2}$ inches diameter, cream ground flushed Porcelain Rose (H.C.C. 620/3) particularly towards the margins of the standards.

FLOWERS PALE BLUE

Calcot (raised, introduced and sent by Messrs. Sutton & Sons, Ltd., Reading.) **A.M.** June 12, 1950.—Plant very vigorous, flower stems stiff, 14 inches long, mostly four flowered, some fives, well spaced; flowers $2\frac{1}{2}$ inches diameter, Veronica Violet (H.C.C. 639/1) with deeper shadings and pencilled deep violet at base of standards; wings a shade darker shaded Methyl Violet (H.C.C. 39/2).

Blue Cloud (raised and sent by B. R. Jones, Esq., Warwick Hospital, Lakin Road, Warwick). **A.M.** June 12, 1950.—Plant very vigorous, flower stems stiff, 14 inches long, mostly four flowered, some fives; flowers well spaced, $2\frac{1}{2}$ inches diameter, of good substance; standards Mauvette (H.C.C. 537) flushed Sea Lavender (H.C.C. 637/1); wings Veronica Violet (H.C.C. 639/2) faintly tinged Wistaria Blue (H.C.C. 640/1).

FLOWERS BLUE

Robert (raised by Mr. Frank Cuthbertson, introduced and sent by Ferry-Morse Seed Co., San Francisco, California, U.S.A.). **A.M.** June 12, 1950.—Plant vigorous; flower stems 12 to 14 inches long, stiff, mostly five flowered, a few sevens, well and evenly spaced; flowers 2 inches diameter, of good substance, Violet (H.C.C. 36/1) on a base of Aster Violet (H.C.C. 38/1), wings of a deeper shade.

FLOWERS ORANGE-CERISE

Vanity (raised, introduced and sent by Messrs. R. Bolton & Son, Birdbrook, nr. Halstead, Essex). **A.M.** June 12, 1950.—Plant vigorous, flower stems stiff, 15 inches long, four flowered, well and evenly spaced; flowers $2\frac{1}{2}$ inches diameter, of good substance, Geranium Lake (H.C.C. 20/2) when fully open, deepening with age, flushed Scarlet (H.C.C. 19) on a cream ground.

Bright Eye (raised, introduced and sent by Messrs. R. Bolton & Son, Birdbrook, nr. Halstead, Essex.) **H.C.** June 12, 1950.—Plant vigorous, flower stems stiff, 14 inches long, four flowered; flowers $2\frac{1}{2}$ inches diameter, Geranium Lake (H.C.C. 20/2) deepening with age, on a white ground.

FLOWERS SCARLET

Delight (raised, introduced and sent by Messrs. W. Atlee Burpee Co., Philadelphia, U.S.A.). **H.C.** June 12, 1950.—Plant vigorous; flower stems 12 to 14 inches long, four flowered; flowers $2\frac{3}{4}$ inches diameter, Scarlet (H.C.C. 19/1) with distinct veining of a deeper shade, on a cream ground.

FLOWERS CRIMSON-SCARLET

Matador (raised, introduced and sent by Mr. P. Simons, Lyndhurst Nurseries, Ardleigh, Essex). **A.M.** June 12, 1950.—Plant vigorous, flower stems 12 to 14 inches long, four flowered, a few fives; flowers $2\frac{1}{4}$ inches diameter, well and evenly spaced, of good substance, Orient Red (H.C.C. 819) with a sheen of Signal Red (H.C.C. 719).

PARSLEY AT WISLEY, 1949-50

Eighteen stocks of Parsley were sent to Wisley for trial in 1949. They were all sown on April 6 and again on July 14, 1949, and finally judged by a sub-committee of the Fruit and Vegetable Committee on April 28, 1950, who made their recommendations for awards as given below.

Light Green

The following variety was grown: PEROSO SPECIAL (P. Rood), dwarf habit.

Medium Green

The following varieties were grown: EXTRA MOSS CURLED (Dachnfeldt), MOSS CURLED IMPROVED (Hurst), MULTICURL (Associated Seed Growers), PARAMOUNT (Ferry-Morse), PEERLESS (Nutting).

Medium to Dark Green

Champion Curled (sent by Messrs. Harrison & Sons (Maidstone) Ltd., Maidstone, Kent). **A.M.** April 28, 1950.—Plant vigorous, 11 inches tall; foliage double moss-curled, medium emerald green; leaf stalks 6 inches long; stands well. A true and a regular stock.

Perennial Moss Curled (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** April 28, 1950.—Plant vigorous, 11 inches tall; foliage double moss curled, medium emerald green; leaf stalks 6-7 inches long; stands well. A more closely and finely curled strain than 'Champion Curled.' A true even stock. (**F.C.C.** 1919).

The following varieties were grown: DOUBLE CURLED ASCO (Chr. Olsen), a variable stock, EVERGREEN (Ferry-Morse), EXHIBITION (Clucas), EXHIBITION (Dobbie) a variable stock, EXTRA FINE CURLED (Hurst), EXTRA TRIPLE CURLED (Ferry-Morse) a variable stock, PERENNIAL MOSS CURLED (Tozer), stock variable.

Dark Green

Imperial (raised, introduced and sent by Messrs. Sutton & Sons Ltd., Reading). **H.C.** April 28, 1950.—Plant vigorous, 9 inches tall; foliage very closely moss curled, dark green with a grey tinge; leaf stalks 4 to 6 inches long; stands well. A true even stock.

The following variety was grown: CHAMPION MOSS CURLED (Yates), distinct from the other variety sent under this name.

Very Dark Green

The following variety was grown: NEW DARK GREEN WINTER (Clucas), very variable, requires further selection.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1950

TREES AND SHRUBS

Eucalyptus Gunnii A.M. June 27, 1950. This is the hardiest member of the genus, forming a tree of 60 feet or more in this country. The leaves are elliptic-obovate, acute, rounded at the base, about $1\frac{1}{2}$ inch long and dark bluish-green in colour. The sulphur-yellow flowers are borne in axillary stalked clusters of two or three. Exhibited by Messrs. C. H. Taudevin, Raby Nurseries, Willaston, Wirral, Cheshire.

Malus ioensis plena F.C.C. May 23, 1950. The fragrant, semi-double flowers of this attractive Crab are borne 5 or 6 together in leafy clusters. When fully expanded the individual flower is fully 2 inches in diameter; in colour it is a beautiful shade of Carmine Rose (H.C.C. 621/1) internally and varying on the outside from Rose Madder (23/3) to Tyrian Rose (24/3). It received the A.M. on May 21, 1940, when shown by Iris Lady Lawrence. Exhibited by Mrs. E. M. Holden, Goldwell, Newbury.

RHODODENDRONS

Rhododendron 'Angelo' var. 'Sheffield Park' (*discolor* × *Griffithianum*) A.M. June 13, 1950. This magnificent variety of the popular hybrid bears large, narrow leaves often up to eight inches in length. The heavy, globular truss is typical of its parents and is up to nine-flowered. The corolla is large, broadly campanulate, $3\frac{1}{2}$ inches × $5\frac{1}{2}$ inches wide and pure white, except for a faint, greenish-yellow blotch deep in the base of the tube. Exhibited by Captain A. Granville Soames, Sheffield Park, Uckfield, Sussex.

Rhododendron 'Conroy' A.M. May 23, 1950. A fine garden hybrid resulting from the cross between *cinnabarinum* var. *Roylei* and *concatenans*. The loose truss is composed of about six pendent flowers each tubular-campanulate in shape, deeply lobed, glaucous, fleshy and coloured a pleasing shade of light orange (H.C.C. 12/2) with a rosy tinge. White scales cover the calyx, pedicel, petiole, and underside of the foliage. Exhibited by Lord Aberconway, C.B.E., LL.D., V.M.H., and the National Trust, Bodnant, North Wales. (Fig. 207.)

Rhododendron 'Fascinator' A.M. April 4, 1950. A hardy flowering shrub resulting from a cross between 'Hiraethlyn' and *repens*. The truss, about nine flowered, is loose and flat-topped, bearing funnel-shaped blooms of a rich Carmine (H.C.C. 21) shot with Turkey Red (H.C.C. 721) and some faint spotting. Exhibited by Lord Aberconway, C.B.E., LL.D., V.M.H., and the National Trust, Bodnant, North Wales.

Rhododendron 'Francis Hanger' A.M. June 27, 1950. An unusual-coloured hybrid of late-flowering habit from the cross *dichroanthum* × 'Isabella.' Each large truss, composed of about seven flowers, is loose and flat-topped. The corolla is large and fleshy, with deeply cut lobes, the margins of which are frilled and edged with a delicate, light tinge of pale rose that contrasts pleasantly with the deep, yellow colouring of the remaining part of the corolla. Exhibited by E. de Rothschild, Esq., Exbury, nr. Southampton.

Rhododendron 'Gladys' var. 'Rose' (*campylocarpum* × *Fortunei*) A.M. May 2, 1950. The lax, irregular truss of this plant is made

up of nine flowers each with a long, red-stained pedicel. The corolla is of a pale-cream colour darkening on the upper three lobes and showing a crimson blotch in the throat; in contrast, the buds are light, rosy-pink. Exhibited by the Commissioners of Crown Lands, Windsor Great Park, Berks.

Rhododendron 'Janet' ('Dr. Stocker' \times 'Avalanche') A.M. April 4, 1950. The robust habit of this plant makes it particularly suitable for the larger type of garden. Its flowers are nearly five inches wide, with deep lobes and waved margins. The upper three petals show a basal stain of deep crimson which is thrown into relief by the pure white of the remaining part of the corolla. Exhibited by E. de Rothschild, Esq., Exbury, nr. Southampton.

Rhododendron 'Inamorata' (*Wardii* \times *discolor*) A.M. June 27, 1950. This hybrid exhibits the finest characters of both of its parents; the flowers are similar to those of *Wardii* and its robust habit, derived from *discolor*, will doubtless make it the subject of future hybridisation. Each flower has a long pedicel and is flat-campanulate in shape; its colour is a pale shade of yellow with a small, spotted, crimson blotch in the throat. The style is long, prominent and distinctly papillose. Exhibited by E. de Rothschild, Esq., Exbury, nr. Southampton.

Rhododendron 'Kiev' ('Barclayi' \times *Elliotii*) A.M. May 2, 1950. Each loose, flat-topped truss of this hybrid is made up of about eight flowers. The corolla is campanulate, three inches long and four inches wide, large and fleshy with distinct, basal nectaries and coloured a deep, unusual shade of Blood Red (H.C.C. 820/3) which is darkened by heavy spotting, especially on the upper three lobes. The petiole is stout and scaly and the leaves long with a dull mat-green colouring. Exhibited by E. de Rothschild, Esq., Exbury, nr. Southampton.

Rhododendron magnificum A.M. March 21, 1950. This member of the Grande Series was collected by Capt. F. Kingdon-Ward and introduced from Upper Burma in 1931 under his number K.W. 9200. In favoured gardens it makes a fine tree with large leaves 11 inches long and four inches wide. The tubular flowers are coloured Fuchsine Pink (H.C.C. 627/2) with darker venation, and are borne in a large, dome-shaped truss. The species is, however, somewhat slow to reach maturity and it is often several years before flowering commences. Exhibited by Lt.-Col. D. R. Carrick-Buchanan, Corsewell, Stranraer, Wigtownshire.

Rhododendron 'Mariloo' var. 'Eugenie' A.M. April 4, 1950. This strong-growing hybrid from the cross 'Dr. Stocker' \times *lacteum* is ideally suited to the woodland garden. Its funnel-shaped flowers, up to four inches across, are of a pale-cream colouring, darkening on the upper three lobes, marked with small, crimson spots and stained with crimson in the base of the throat. The flowers, up to seventeen in number, are borne in a large, heavy, flat-topped truss. Exhibited by E. de Rothschild, Esq., Exbury, nr. Southampton.

Rhododendron 'Morawen' A.M. May 23, 1950. A magnificent hybrid from the cross 'Isabella' \times 'Shepherd's Delight.' Each leaf is up to eight inches long and three inches wide, and while of a light green colour above is somewhat paler beneath. The truss is large and heavy, consisting of up to fourteen flowers, each of which is funnel-campanulate

in shape, fleshy and of a pleasing Phlox Pink shade (H.C.C. 625/1) with the upper three petals slightly marked with dark-pink spotting. Its stamens are thirteen in number, pubescent and sited in deep, basal nectaries. Exhibited by Admiral A. Walker-Heneage-Vivian, C.B., M.V.O., D.L., Clyne Castle, Blackpill, Swansea.

Rhododendron 'Rouge' A.M. June 13, 1950. This hybrid was raised by the late Mr. Lionel de Rothschild from the parents T.L. No. 1249 \times *Elliotii*. Its leaves are about eight inches long, broadly lanceolate and pale mat-green in colour. Flowers, borne in a heavy truss, are large and fleshy, $3\frac{1}{2} \times 4\frac{1}{2}$ inches wide, broadly campanulate and show pronounced lobing. Exhibited by E. de Rothschild, Esq., Exbury, nr. Southampton.

Rhododendron 'Trewithen Orange' F.C.C. April 4, 1950. This beautiful hybrid is the result of a cross between 'Full House' (*cinnabarinum* var. *blandfordiaeflorum* \times *Maddenii*) and *concatenans*. The truss consists of about five pendent, deeply-lobed flowers coloured a pleasing shade of Carrot Red (H.C.C. 612/1 612) with a faint, rosy blush. Exhibited by G. H. Johnstone, Esq., O.B.E., Trewithen, Cornwall.

Rhododendron 'Winsome' ('Humming Bird' \times *Griersonianum*) A.M. May 23, 1950. A fine vase of this plant was shown illustrating its strong, floriferous habit. The truss is irregular, loose, pendent and shows a varying number of flowers. The long corolla is coloured Neyron Rose (H.C.C. 623) with edges marginate and slightly waved. The leaves are similar to its parent *Griersonianum*, being mucronate, recurved, dull green above, and the underside covered with a loose brown tomentum. Exhibited by Lord Aberconway, C.B.E., LL.D., V.M.H., and 'The National Trust, Bodnant, North Wales. (Fig. 208.)

ROSES

Rosa anemonoides 'Ramona' A.M. May 23, 1950. This vigorous climbing Rose is a sport from *R. anemonoides*, and has single flowers, $3\frac{1}{2}$ inches across, of Persian Rose (H.C.C. 628), paler on the reverse of the petals (628/3). Exhibited by Messrs. T. Hilling & Co., Chobham, Woking. (Fig. 210.)

Rose 'Claude' A.M. June 27, 1950. A fully double bright crimson, long petalled H.T. variety of good shape, raised in France by Monsieur Charles Mallerin. Exhibited and introduced by Messrs. Wheatcroft Bros., Ltd., Ruddington, Nottingham.

Rose 'Eden Rose' A.M. July 11, 1950. A H.T. variety raised in France by Monsieur F. Meilland and having very full, sweetly scented, bright madder-pink flowers of good shape. Exhibited and introduced by Messrs. Wheatcroft Bros., Ltd., Ruddington, Nottingham.

Rose 'Monique' A.M. June 27, 1950. A strongly scented H.T. variety with large fully double glowing Rhodamine Pink (H.C.C. 527) flowers of perfect shape reminiscent of 'Picture' but with greater substance. The plant is a stiff strong grower and was raised in France by Monsieur Francis Meilland. Exhibited and introduced by Messrs. Wheatcroft Bros., Ltd., Ruddington, Nottingham.

Rose 'Moonbeam' A.M. July 11, 1950. A finely shaped primrose-yellow (H.C.C. 601/2) H.T. variety deepening to aureolin (H.C.C. 3) at the base of the petals. It was raised by Mr. Herbert Robinson as the result of a cross between 'McGredy's Yellow' and an unnamed Rose No. 5. It is said to be a good forcing variety. The flowers have a good scent and are borne on remarkably strong stems. Introduced by Messrs. Bakers, Ltd., Wolverhampton. Exhibited by Mr. Herbert Robinson, Victoria Nursery, Burbage, Hinckley, Leicester.

Rosa spinosissima 'Frühlingsgold' A.M. May 23, 1950. This makes a graceful shrub up to 8 feet tall, with plentiful semi-double flowers, up to 4 inches across, of Mimosa Yellow (H.C.C. 602/3). The leaves are made up of about 7 leaflets, pubescent on the underside. Exhibited by Messrs. T. Hilling & Co., Chobham, Woking. (Fig. 209.)

Rose 'Sultane' A.M. June 27, 1950. A well shaped, strongly perfumed, fully double H.T. variety with Cherry (H.C.C. 722) petals having a saffron yellow (H.C.C. 7) reverse. It is a good grower and was raised in France by Monsieur Francis Meilland. Exhibited and introduced by Messrs. Wheatcroft Bros., Ltd., Ruddington, Nottingham.

Rosa 'Wedding Day' A.M. June 13, 1950. An extremely handsome climbing Rose raised by the exhibitor by selfing a hybrid from the cross *R. Sinowilsoni* × *R. Moyesii*. The vigorous, arching growths, bearing shining, light green leaves composed of five oval leaflets, reach a height of ten feet or more. The sweetly-scented flowers are arranged in shapely panicles about 9 inches long at the ends of spreading lateral branchlets. The buds are at first Naples Yellow (H.C.C. 403) and open to saucer-shaped, creamy-white flowers 2 inches across with broad obovate petals and large clusters of saffron-yellow stamens. Exhibited by Col. F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Highdown, Goring-by-Sea, Sussex.

Rose 'Yves Latieulle' (shown as Mme. Yves Latieulle) A.M. July 11, 1950. A large rich lemon yellow, H.T. variety, with fully double flowers of excellent shape. It was raised in France by Monsieur F. Meilland. Exhibited and introduced by Messrs. Wheatcroft Bros., Ltd., Ruddington, Nottingham.

Syringa vulgaris 'Primrose' A.M. May 23, 1950. This variety has flowers of a colour not normally found among Lilacs. It is Empire Yellow (H.C.C. 603/2) in the bud, fading paler as the flower ages, although each floret retains the deeper shade in the centre. The huge branches exhibited show that the plant forces well. Exhibited by Mr. Jan Spek, Boskoop, Holland.

ROCK GARDEN PLANTS

Androsace pyrenaica A.M. April 4, 1950. This distinct species is to be found naturally in the Central Pyrenees. The uniform cushion is composed of rosettes of longish, blunt leaves, somewhat hairy. The flower stems reach up to $\frac{1}{2}$ inch in length with each carrying a single, white flower. These are 5-petalled, emarginate, and have a bright, yellow eye. Exhibited by C. H. Hammer, Esq., The Old Rectory, Boreham, Essex.

Anemone vernalis A.M. March 29, 1950. Found naturally in high alpine grasslands throughout Europe, this early-flowering species has proved a fine garden plant. Its leaves are pinnately divided into 2 or 3 pairs of toothed leaflets appearing on a densely hairy stem. The buds, covered with long rust-coloured hairs, are coloured a pearly white inside and stained with a light purple on the outside. As the flower develops the opening petals reveal a dense cluster of bright golden stamens. Exhibited by Mrs. A. N. Griffith, Paradise House, Newnham, Cambridge.

Campanula garganica var. fenestrellata A.M. June 27, 1950. A hardy plant about 2–3 inches high which will enhance any open, well-drained site with its floriferous habit and long flowering period. The star-shaped flowers are of a bright, lavender-blue colour with a white-fringed centre, made prominent by the slight reflexing of its petals and by its long style. Exhibited by Mrs. A. N. Griffith, Paradise House, Newnham, Cambridge.

Campanula pelia A.M. May 23, 1950. Many wild forms of this prostrate alpine have been collected from time to time. Flowers, which are borne freely among the grey foliage, are tubular in shape with five distinct segments and coloured a pleasing shade of light velvet-blue. Exhibited by H. Clifford Crook, Esq., 4 Alexandra Crescent, Bromley, Kent.

Campanula pilosa var. dasyantha A.M. April 25, 1950. Flowers of this Japanese species appear singly on leafy stems. The perianth made up of distinct, hairy sepals and a corolla of violet-blue petals with a white inner lining. Its leaves are a bright, olive-green colour, serrate and about 1 inch long. Exhibited by R. E. Heath, Esq., 13 Maybury Close, Petts Wood, Kent.

Dionysia bryoides A.M. February 14, 1950. A particularly fine specimen of this plant was shown bearing numerous, 5-petalled, starry flowers. These were coloured Fuchsine Pink (H.C.C. 627/3) with a small white eye, while the buds, almost stemless and arising from tight rosettes of leaves, are the darker shade of Fuchsia Purple (H.C.C. 28/1). The plant is not one of easy culture and conditions approximating to its natural habitat necessitate the use of a sharp, sandy compost, good drainage and the utmost care in watering. Exhibited by C. H. Hammer, Esq., The Old Rectory, Boreham, Essex.

Iris cristata A.M. April 18, 1950, as a hardy flowering plant, suitable for the rock garden or alpine house. A native of the south-eastern United States of America from Georgia to Ohio. This species, which belongs to the *Evansia* section, is practically stemless and the flowers are carried on the perianth tube which rarely exceeds four inches. The rhizome increases rapidly and produces a vertical tuft of three or four leaves. The flowers are borne singly or in pairs. Standards Veronica Violet (H.C.C. 639/1) flushed Sea Lavender Violet (H.C.C. 637/2). Falls Aster Violet (H.C.C. 38/2) with a central white ridge or crest to the haft where it is tipped with yellow and white. Shown by Mr. J. O. Sherrard, Shaw Nursery, Newbury, Berks.

Primula 'Bractworth' A.M. March 7, 1950. This pleasing hybrid is the result of a cross between *Primula bracteosa* and *P. Edgworthii*. The lanceolate leaves are about 3 inches long and very heavily coated in

farina. Its numerous flowers are of a Mallow purple colour (H.C.C. 630) with a distinctive, central eye of Citron Green (H.C.C. 763/2) ringed with white. Exhibited by Mrs. C. B. Saunders, Husseys, Green Street Green, Farnborough, Kent.

***Primula eburnea* A.M.** May 2, 1950. This species, recently sent home by Messrs. Ludlow and Sherriff, was first collected in 1915 by Mr. R. E. Cooper when he found it growing at high altitudes among peaty turf and glacial debris. The flowers are of a pale cream colour and are borne in a tight cluster on a 8-inch stalk. The leaves of the plant are somewhat lax, irregular in shape and are deeply serrated. Exhibited by J. T. Renton, Esq., Branklyn, Perth.

***Sempervivum arachnoideum* var. *Laggeri* A.M.** June 27, 1950. A particularly fine pan of this plant was shown well illustrating its floriferous habit. A succession of brick-red coloured flowers, centred with numerous stamens appear in terminal clusters, each consisting of about nine blooms in each head. These are borne on a long, leafy scape arising from a basal rosette typical of the genus although, in this case, particularly well-covered with cob-webbing. Exhibited by W. Howell, Esq., The Town Hall, Beckenham, Kent.

***Vaccinium Delavayi* A.M.** May 23, 1950. This Yunnanese shrub is not of difficult culture and is suited for both the Alpine House and the Rock Garden. Small, white flowers appear on the compact branches in May and are followed by black berries with a greyish bloom, typical of the more common members of the genus. Exhibited by R. E. Heath, Esq., 13 Maybury Close, Petts Wood, Kent.

BULBS, CORMS, AND TUBERS

***Allium albopilosum* A.M.** June 13, 1950. This very striking herbaceous plant is probably the largest flowered species of the genus, and it was first introduced to cultivation from Persia in 1901. The strap-shaped, hairy leaves are about 18 inches long and 2 inches wide; the scape is erect, about a foot long, bearing a dense globular head of about 80 flowers. Each has 6 spreading, linear tepals of a deep lilac colour with a satin sheen, which become rigid as the flower ages. Exhibited by Sir Cedric Morris, Benton End, Hadleigh.

***Begonia* 'Shirley Desire' A.M.** July 11, 1950. A trailing variety suitable for cultivation in hanging baskets. The bright carmine rose flowers are 4 inches across and very fully double. They are produced in great profusion on the long growths which measure up to 3 feet in length. Raised, introduced and shown by Messrs. H. Woolman, Ltd., Shirley, Birmingham.

***Lilium Mackliniae* A.M.** May 23, 1950. A new species collected by Capt. F. Kingdon-Ward on Sirhoi Peak, nr. Umrhul, Manipur in 1946, and fully described and illustrated in the JOURNAL for August, 1949. It promises to be hardy, and in the garden forms a plant about 18 inches high with densely leafy stems bearing a terminal group of 2 or 3 flowers. The flower is nodding, bell-shaped, about 2 inches long, white, flushed externally with rosy-purple. Exhibited by Col. F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Highdown, Goring-by-Sea, Sussex.

Lilium 'Dunkirk' A.M. June 27, 1950. A most striking hybrid raised by Mr. F. L. Skinner of Manitoba. The stout stem is nearly five feet tall, covered with dark green, lanceolate leaves about 5 inches long, and bears a terminal, many-flowered raceme of well-spaced and long-stalked flowers about 4 inches across. The colour is best described as a lustrous and glowing mahogany-red, and is intensely rich in full sunshine. The perianth-segments are $2\frac{1}{2}$ to 3 inches long, recurving, with a distinct bearded crest near the base, and speckled with small, dark, raised spots. Exhibited by W. Bentley, Esq., Quarry Wood, Burghclere, Newbury. (Fig. 199.)

Narcissus 'Frigid' F.C.C. May 23, 1950. As a variety for exhibition. This Small-cupped variety (Division 3c) received an **Award of Merit** on May 20, 1947. See JOURNAL 72, 405. Raised and shown by Mr. Guy L. Wilson, The Knockan, Broughshane, Co. Antrim, Northern Ireland.

Narcissus 'Santa Claus' A.M. May 23, 1950. As a variety for exhibition. A well-formed fully double white variety of *Narcissus poeticus* with a flower about 3 inches in diameter borne on a 20-inch stem. Raised and shown by Mr. Guy L. Wilson.

ORCHIDS

Cymbidium 'Albania' var. 'Delight' A.M. May 23, 1950. The spike bore seven whitish flowers, the labellum lightly spotted with rose. The result of crossing *albanense* with *Alexanderi*. Raised and exhibited by Messrs. Sanders, St. Albans.

Cymbidium 'Clare Armstrong' var. 'Greensleeves' A.M. May 23, 1950. The spike bore eight flowers, light greenish cream colour, the labellum bordered with crimson. Produced by crossing *Alexanderi* with 'Mirella.' Raised and exhibited by Messrs. Armstrong & Brown, Tunbridge Wells.

Laeliocattleya 'Arcadia' A.M. May 23, 1950. The flower has broad sepals and petals and a well-developed labellum. In colour rosy mauve, the labellum crimson-purple. The result of crossing *Lc.* 'Jupitus' with *Lc.* 'Areca.' Raised and exhibited by McBean's Orchids Ltd., Cooksbridge.

Odontioda 'Marispum' var. 'Dainty' A.M. June 13, 1950. The spike bore seven large, well-formed flowers, blush rose, all the segments minutely spotted with rose-purple. The result of crossing *Oda.* 'Marie Antoinette' with *Odm. crispum*. Raised and exhibited by Messrs. Charlesworth & Co., Haywards Heath.

Odontoglossum 'Mary' var. 'Chromos' A.M. May 23, 1950. The spike bore six well-formed flowers, chrome-yellow with red-brown markings. The result of crossing 'Brimstone Butterfly' with *triumphans*. Exhibited by the Hon. Mrs. Ionides, Buxted Park, Uckfield.

Odontoglossum 'Princess Elizabeth' A.M. June 13, 1950. The tall spike carried ten large flowers, resembling a glorified form of *O. crispum*. Blush-white with light rose suffusion on the backs of the segments. The result of crossing *O.* 'Faustina' with *O. crispum*. Raised and exhibited by Messrs. Charlesworth & Co., Haywards Heath.

HERBACEOUS PLANTS

CARNATIONS

Carnation 'Allwood's Golden Glory' A.M. May 23, 1950, as a variety for exhibition and market. A perpetual flowering variety with a good stiff stem and of good form and substance. Flowers fully double, $3\frac{1}{2}$ inches diameter, Mimosa Yellow (H.C.C. 602/1) flaked with Scarlet (H.C.C. between 19 and 19/1). Raised and shown by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex.

BORDER CARNATIONS

Border Carnation 'Lothersdale' A.M. July 11, 1950, as a show variety. Flower stems stiff and erect, 13 inches long; flowers flattish, open, with a small tuft of petals at the centre, 3 inches diameter; petals flat, broad, yellow ground fancy, heavily edged and flaked with deep crimson; calyx strong. Shown by W. Whiston, Esq., Lothersdale, Far Heath, Winterley, Sandbach.

Border Carnation 'Royal Mail' F.C.C. July 18, 1950, as a show variety. Described R.H.S. JOURNAL 74, 511. Flowers bright pillar-box red. Raised and shown by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs. (A.M. 1949).

Border Carnation 'Sunstar' A.M. July 18, 1950, as a show variety. Flower stems erect, stiff, 20 inches long. Flowers double, 3 inches diameter with a small tuft of petals at the centre; petals flat, entire, soft yellow edged and lightly flaked with scarlet. Raised and shown by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs.

DIANTHUS

Dianthus 'Show Discovery' A.M. June 13, 1950, as an exhibition variety. Flower stems strong, erect, 15 inches long. Flowers double, $2\frac{1}{2}$ inches diameter, flat, strongly scented, deep rich rose-red with a ruby eye. Raised and shown by Messrs. Allwood Bros., Ltd., Haywards Heath, Sussex.

Dianthus 'Show Pearl' A.M. June 13, 1950, as an exhibition variety. Flower stems 15 inches long, strong, upright. Flowers semi-double, $2\frac{1}{4}$ inches diameter, flat, with a few tufted petals at centre, creamy-white with a slight green eye. Raised and shown by Messrs. Allwood Bros. Ltd., Haywards Heath, Sussex.

Dianthus 'William Brownhill' A.M. June 13, 1950, as an exhibition variety. Flower stems 12 inches long, strong, erect. Flowers $1\frac{3}{4}$ inch diameter, semi-double, flat, open, somewhat scented, white ground laced and zoned maroon. Shown by Messrs. Thomas Carlile (Loddon Nurseries) Ltd., Carlile's Corner, Twyford, Berks.

Dicentra formosa alba. A.M. May 23, 1950. *Dicentra formosa* is a small herbaceous plant suggesting a small edition of the 'Bleeding Heart,' to which it is closely allied. It has a tuft of pale green, ternately compound, rather fern-like foliage and slender arching racemes of pendulous flowers, typically rosy-purple, but pure white in this variety. Exhibited by Messrs. C. G. Van Tubergen, Ltd., Haarlem, Holland.

IRISES

Iris 'Jemmy O'Goblin' A.M. May 23, 1950, for general garden use, as a hybrid between *I. innominata* and *I. Douglasiana*, with rather narrow dark green foliage. Flowers 3 inches diameter, 2 inches deep. Standards erect, $1\frac{3}{4}$ inch long, $\frac{1}{2}$ inch wide, Buttercup Yellow (H.C.C. between 5/1 and 5/2) suffused with Chinese Yellow (H.C.C. 606/1). Falls drooping, 1 inch long, $\frac{3}{4}$ inch wide, Buttercup Yellow (H.C.C. 5/2) heavily suffused with Chinese Yellow (H.C.C. 606/1) blotched Saffron Yellow (H.C.C. 7). Raised and shown by H. Senior Fothergill, Esq., 12 Abercorn Place, London, N.W. 8.

Iris 'Tranquil Dale' A.M. May 23, 1950, for general garden use, as a hybrid between *I. innominata* and *I. Douglasiana*, with rather narrow dark green foliage. Flowers three inches diameter, two inches deep. Standards $1\frac{3}{4}$ inch long, $\frac{1}{2}$ inch wide, soft Chrome Yellow (H.C.C. 605/2) flushed with soft bronzy purple. Falls drooping one inch long, $1\frac{1}{2}$ inch wide, somewhat of a deeper shade than the standards but with deep brown feathering. Raised and shown by H. Senior Fothergill, Esq., 12 Abercorn Place, London, N.W. 8.

Iris spuria 'Lilacina' A.M. June 13, 1950. An Apogon Iris from Kashmir, 3 feet in height with dark green foliage. Flower spikes 4 or 5 flowered. Standards erect, broad lanceolate, $2\frac{1}{2}$ inches long, $\frac{3}{4}$ inch wide, margins waved, Sea Lavender Violet (H.C.C. 637) with a Mineral Violet (H.C.C. 635/1) flush towards the base. Falls drooping $1\frac{1}{4}$ inch long, $1\frac{1}{8}$ inch broad, almost circular, waved at margins, Veronica Violet (between H.C.C. 639 and 639/1) with darker veining, with a central bright yellow streak midway to haft. Shown by Col. F. C. Stern, Highdown, Goring-by-Sea, Sussex.

Paeonia arietina 'Hilda Milne' A.M. May 23, 1950. A lovely single Paeony with cup-shaped flowers 4 inches across of Rose Madder (H.C.C. 23/3) shading to Tyrian Rose (24/2) on the edges of the petals. The filaments surrounding the tomentose carpels are pale pink, stained crimson at the base, the anthers yellow. The leaves are bipinnate with about 11 leaflets, light green above, glaucous beneath, their margins slightly undulate. Exhibited by Miss Milne, Dykes, Henfield, Sussex.

Primula 'Viatans' A.M. May 23, 1950. A hybrid between *P. Viali* and *P. nutans*. The flowers, intermediate in size between those of the parent species, are of a soft, rosy-heliotrope colour, pendent in a dense spike 3 inches long. The scape is 15 inches tall, rising from a rosette of oblanceolate, irregularly dentate, downy leaves. Exhibited by the Bartley Nurseries, Bartley, Southampton.

BOOK NOTES

"La Taille des Arbres Fruitières." By Paul Champagnat. 8vo. 217 pp. Illus. (La Maison Rustique, Paris VI°). 510 francs.

A brief notice cannot hope to do justice to what is undoubtedly the most complete and important book on the pruning of fruit-trees so far published in any language, and one likely to become authoritative. M. Champagnat, who is Chef de Travaux of the Strasbourg Institut Botanique, divides his material into three parts:—1, the

tree, its metabolism, morphology, and physiology; 2, pruning for formation; and 3, pruning for yield. In the last section four systems, copiously illustrated, are considered in detail:—Short-Spur Pruning (*système trigemme*); Modified Spur-Pruning (*système polygemme*); the Lorette System, with an interesting note on Lorette's precursor, J. Desbois; and Arching, exemplified both by the Lepage "*palmettes à longs bois arqués*" (a succession of single cordons of no great height forming double or even triple tiers of branches trained downwards in alternating directions) and the German "*Spindelbusch*" formation with horizontally trained branches for bush trees. Each problem is first exactly stated; its possible solutions are then lucidly described and their respective advantages and drawbacks impartially set forth. This book is almost unique of its kind in that the existing limits of pomological knowledge are everywhere firmly underlined, a check which proves particularly illuminating in the analyses of the various theories advanced to explain "*le barrage de sève*" and the pros and cons of staking. Since even trees of the same variety evince as much individuality in growth as do men, there can be no universally applicable "right form" for one and all of them. Hence the grower is urged to acquire the habit of reflecting and reasoning before using the knife when he looks over his trees. "In this way he will quickly learn the relatively simple 'how' of pruning, and also begin to gain an inkling into the far more baffling 'why'."

M. Champagnat suggests that as repeated tests show no tangible difference in results between November and March pruning, early October may be the ideal time, because, though growth has virtually ceased, the shoots still retain their foliage. We are told that the Germans, having a much wetter climate than France, were quite logical in giving up close pruning: a reason that would seem to apply with even greater force to England. There are valuable incidental notes on Dalchow's "*Starkaugenschnitt*" for nursery work, and the so-called "*Palmette de Montreuil*," a labour-saving type of fan for walls, "*formée au diable*," which has proved a very heavy-cropping formation for that tender dessert apple 'Calville blanc.' Almost the only points the author allows himself to stress are consistently long pruning for weak growth, the fruitful uses to which 'robber' shoots should be turned, and the necessity for regular thinning of both blossom and fruit to correct bi-annualism.

During the war the author was deported by the Germans from France to Prussia for agricultural work, an experience which, however unpleasant for him, has added to the value of the book by giving him a practical acquaintance with German in addition to French pruning methods.

P. MORTON SHAND.

"An Introduction to Botany." By J. H. Priestley and Lorna I. Scott. Second ed. Pp. xii + 625. 169 Illus. (Longmans, Green & Co.) 21s.

The many hundreds of students, not only of Leeds University but of many other teaching centres, who have relied upon Priestley & Scott's "Introduction" for their knowledge of general botany will welcome the appearance of a revised edition of the famous work. Written though it was for first-year students, it startles always by its erudition and its original and stimulating approach. Professor Priestley, whose death during the war was so great a loss to the botanical world, was above all things a physiological botanist rather than a physiologist, that is, he interpreted botanical phenomena in terms of physiological function and his teaching differed from that of so many of the classical schools of botany in that physiology was taught not as a separate subject of botany but rather as the co-ordinating thread running through all morphological and histological studies.

Beginning with descriptive morphology of seed and seedling, shoot and leaf, the book passes to the microscopical structure of the stem apex and of the leaf, pausing then to consider the chemical processes of the plant as exemplified in the laboratory of the leaf before continuing to stem and root structure. Consideration of this last leads naturally to the physiology of absorption and nutrition and the special problems of saprophytism and parasitism.

A chapter on the reproductive phase reveals a most remarkable omission—no mention is made of the large, though admittedly very incomplete, field of developmental physiology. Vernalization, photoperiodism and the phenomena of dormancy are not even mentioned. Perhaps the omission of this even in a second edition, prepared after the senior author's death, may be explained by Professor Priestley's opposition, to the end, to the hormone concept of plant growth and behaviour, for it is only in such terms that we can hope to attain any understanding of these complex but vitally important problems. Even the fundamental and conclusively-proved function of "auxins" in growth-phenomena is cautiously and grudgingly accepted, but dismissed in two or three pages. In the original edition even this scant tribute was not paid.

The book concludes with a brief though, for its purposes adequate, survey of life cycles in the vegetable kingdom and of genetical principles and a chapter on the biology of flower and fruit.

Apart from the omission mentioned, the book is a remarkable treatise and interpretation of botanical knowledge which covers, at least in many aspects, more than its authors modestly claim for it, a course for first-year students.

R. H. STOUGHTON

"Snowdonia, the National Park of Wales." By F. J. North, B. Campbell and R. Scott. Col. Pls. Illus. xviii + 469 pp. (Collins.) 21s.

"Snowdonia" is the first of the New Naturalist series to be devoted to a complete regional survey, and it is the work of more than one author. It is, in fact, three books (each of which might well have been published at half-a-guinea) in one. Dr. F. J. North introduces the reader to Snowdonia by an account of the "Geology and Physical background." He wisely assumes that his public has little knowledge of matters geological, but it may be that the amount he endeavours to impart will overawe and discourage not a few would-be readers. This section is certainly difficult reading in parts; on the other hand, it seems much more complete than the two that follow.

Dr. Bruce Campbell contributes the account of the natural history of Snowdonia, the botanical aspects of which will be taken as the chief interest of readers of this review. The approach to this section is through a brief survey of the Naturalists of North Wales; an appropriate opening, as throughout the succeeding chapters they are frequently quoted. Herein lies a weakness, for the reader of such a book as this may reasonably expect to find an account written from extensive and intimate personal experience. In this he will be disappointed; though we are given an interesting picture of the wild life, which will encourage the new naturalist to visit Snowdonia and may open the eyes of many an older naturalist who already knows the area. Dr. Campbell's persistent citation of authorities, on whom he has relied to fill up the gaps in his personal observations, doubtless springs from a praiseworthy scientific caution; but it detracts considerably from the pleasure of reading a book that is not, after all, a scientific treatise. The botanist will quickly observe a number of discrepancies between the names used in the text and those in the full list of species which is given as an appendix and this rather emphasises the compilatory nature of the work. There are other disturbing errors: on p. 276 there is a reference to Alder Buckthorn (*Rhamnus cathartica*), the latin name is, of course, that of the common Buckthorn and one wonders which was intended. On p. 289 "Rock cress (*Spergula rupestris*)" is completely baffling! Is the plant intended some rock cress such as *Arabis petraea* or is it the Sea Spurrey (*Spergularia rupestris*)? In the Appendix "Hypericum undulatum, Imperforate St. John's Wort" may be taken as an error for *H. dubium*, for *H. undulatum* is neither imperforate nor a native of Snowdonia. One other even more incredible entry has been passed; as a result, presumably, of the omission of two whole lines the appendix has "Orobancha apiculata Wallr. Broomrape. Parasitic on hazel." One can supply the missed lines as follows "Orobancha apiculata Wallr. Broomrape. Parasitic on leguminous herbs, etc. Lathraea squamaria L. Toothwort. Parasitic on hazel." Incidentally the broomrape should still be called *O. minor* Sm. (the name by which it has long been known) and not *O. apiculata* Wallr. To cite these errors is by no means to deny that this section doubtless forms by far the best introduction to the wild life of Snowdonia that is available.

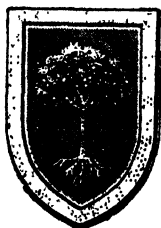
The third section, by Dr. Richenda Scott, deals with the human associations of the area and is the most readable of all three. It is certainly a praiseworthy innovation to have in a naturalist's handbook such an account of man's varying activities in historic times and the botanist will find in this section the clue to much of the present-day pattern of vegetation.

The volume, as are the others of this series, is well provided with coloured illustrations of which the main criticism must be that they present Snowdonia as a land of almost perpetual blue skies and sunshine. All too many holiday visitors will testify to the inaccuracy of this impression. Typographically the text is pleasing, but the printing in the small fount of the appendix is sadly below standard, letter after letter being deprived of corners or serifs by bad printing. To have produced such a volume almost simultaneously with the passing of the National Parks Act suggests publication under pressure and perhaps some sacrifices both in the time allowed to the authors for field studies and in actual printing were knowingly accepted. Whatever its blemishes this is a book that the naturalist visiting Snowdonia should certainly read.

B. L. BURTT

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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Part II

November 1950

THE SECRETARY'S PAGE

ANNOUNCEMENTS—NOVEMBER AND DECEMBER

Shows

TUESDAY, NOVEMBER 7
12 NOON to 6 P.M.

WEDNESDAY, November 8
10 A.M. to 5 P.M.

TUESDAY, December 5
12 NOON to 6 P.M.

WEDNESDAY, December 6
10 A.M. to 5 P.M.

Fortnightly Show.
Floral Arrangement Competition for
Amateurs.
*British National Carnation Society's
Competition.*

Fortnightly Show.
Late Apple and Pear Competition.

Lectures

TUESDAY, November 7 at 3 P.M. "Hardy Heaths" by MR. F. HANGER.

TUESDAY, December 5 at 3 P.M. "Horticultural and Botanical Illustration" by MR. W. BLUNT.

Demonstrations at Wisley—The following demonstrations will be given at Wisley, that on the second day being in each case a repetition of the demonstration given on the first:—

Flower and Fruit Garden

November 1, 2. Planting of Fruit Trees and Roses. (2 to 4 P.M.)

Fruit Garden

November 29, 30. Pruning of Fruit Trees. (11 A.M. to 1 P.M.)

Colour Film.—A film has been prepared by Messrs. Plant Protection Ltd. on the subject of "The Vineyards and the Vines of France." The film describes the normal methods of growing vines including

grafting, pruning, pest and disease control, harvesting etc. and the making of some of the commoner types of wines. This film will be shown in the Lecture Room of the Society's New Hall at 3 P.M. on Wednesday, December 6. Fellows of the Society are invited to attend.

The Society's Examinations—Candidates who wish to enter for the Society's Examinations in Horticulture in 1951 are reminded that the closing dates for entry forms are as follows:—

General Examination in Horticulture, and General Examination in Horticulture for Juniors—Monday, January 15, 1951.

Examination for the National Diploma in Horticulture (Preliminary and Final) and N.D.H. (Honours)—Thursday, February 1, 1951.

Examination for Teachers of School Gardening (Preliminary and Final) Friday, April 27, 1951.

N.D.H. Qualifying Test—Monday, November 20, 1950.

Invited Trials, 1951—Details of these, together with information on the preparation for Invited Trials to be judged in 1952, will be found on page 454.

WISLEY IN NOVEMBER

AFTER this very wet summer it is probable that the full glory of the Autumn colours will not appear until later than usual and therefore November will still see bold masses of crimson, gold and scarlet lighting up all parts of the Gardens. But even those who are unfortunate enough to visit Wisley on a wet or foggy day need not fear that they will be disappointed, for there will be much of interest in the greenhouses.

The collection of Orchids kindly presented last year by the Orchid Growers' Association is fully established in the Stove House and many of them are flowering now. There are a number of *Cypripedium* varieties and several species; for instance that rather rare and interesting plant *C. Fairrieanum*, considered by some to be among the most beautiful of the race. The petals, striped yellow, white and purple, shaped like a buffalo's horn, and fringed with black hairs, give it the appearance of some sinister insect. *C. bellatulum* should also be flowering. A plant of unknown origin, it resembles most closely *C. Godefroyae*. Another plant with an animal-like appearance is *Cirrhopetalum* 'Fascinator,' resembling a number of exotic crimson-striped lizards. One of the easiest to cultivate is *Zygopetalum Mackayi*, introduced from Brazil in 1826. It is valued for its attractive green and maroon markings and sweet scent. The first of the Coelogynes to open should be *C. fuliginosa*; our plant has peach-shaded flowers with a deep chocolate blotch, although there have been many collected forms from various parts of India with flowers varying to white or pink. In addition to these Orchids the house is well stocked with a variety of ornamental foliage plants and a decorative picture is formed round the tank by groups of Poinsettias and *Plumbago rosea* backed by the brilliant orange *Gesnera chromatella*.

The Temperate House is no less bright, the side staging packed with Pelargoniums, Begonias, Gloxinias, Balsams and especially species of Erica and Epacris. These latter are always very welcome at this time of year and it is surprising that the Epacris are not more generally grown.

E. impressa carries arching sprays, up to two feet long, of pink or white bells, while those of *E. ardentissima* are bright salmon-pink. *Erica canaliculata* makes an attractive white-flowered pot plant, but if grown out of doors, as it can be in the west of England, it becomes a striking shrub reaching a height of fifteen feet, the bells then being pale violet. A fine specimen of *Tibouchina semidecandra*, massed with royal purple, velvet-textured flowers, forms a focal point at one end of the house, while at the other *Gestrum puppureum Smithii* is carrying numerous cerise bells in contrast to the orange shades of *C. aurantiacum*. This month sees the first of a long succession of Camellias with *C. japonica magnoliaeflora*.

Flowers are scarce in the Half Hardy House this month, but there are several extremely ornamental foliage plants. *Pyrethrum ptarmicifolium*, with finely dissected silver leaves, is most conspicuous; *Coronilla glauca* var. *pygmaea* forms a dense, grey-green bush; while beneath the satin-textured foliage of *Leucadendron arboreum* there are bright masses of *Convolvulus Cneorum* and *Helichrysum petiolatum*.

If Fellows are fortunate enough to make a visit to the Gardens on a fine sunny day, nothing could be more pleasant than a visit to Seven Acres approached by way of the old Apple Walk, flanked by broad masses of crimson and gold Azaleas and Viburnums and overtopped by the butter-yellow leaves of a fine old Tulip Tree. It may perhaps be by reason of the comparatively mild, frost-free spring we experienced that the ornamental fruiting trees and shrubs are bearing exceptionally heavy crops. There are some outstanding species of *Berberis* such as *B. Jamesiana*, *B. virescens*, the large fruited *B. Chitria* and the evergreen prickly leaved *B. verruculosa*. The Crabs, Cotoneasters (such as the late-ripening *C. lactea*, *C. serotina* and forms of *C. salicifolia*), *Pyracanthas*, *Sorbus* and *Crataegus* blend together to form a mellow autumnal picture.

Autumn tints are afforded by a good specimen of *Quercus coccinea* var. *splendens* clothed in deep crimson leaves, and the varied glowing shades of *Parrotia persica*, Dogwoods and Witch-Hazel. Most of the flowers have faded from the Heather Garden now but the banks of rusty brown, unlike most dead flowers, are far from unsightly.

There are a number of interesting plants in the Award of Garden Merit Collection, for in the case of a great number of the plants, they have been chosen with a view to providing interest during more than one part of the year. *Euonymus alatus* forms a small shrub clothed in unbelievably brilliant scarlet leaves which fall to reveal corky wings along the stems. This feature makes it an interesting plant for indoor decoration during the winter. The bare arching branches of the Snowberry, *Symphoricarpos albus laevigatus*, are weighed down by the waxen white berries. Near by the Cornelian Cherry should be producing small bright red fruits. If the weather is clement, bright yellow flowers of *Sternbergia lutea* will still be appearing among the rocks at the north end of the Collection.

Last month saw the end of the display on the Rock Garden but in the Alpine House the pendent creamy tubular flowers of *Cyrthanthus Mackenii* var. *Cooperi* are freely produced. The leaves of *Sedum cauticolum*, now purple and going thin and papery, form a decorative

touch, as do the strange seed-heads, like rabbits' tails, of *Trichinium Manglesii*. The prostrate *Iberis saxatilis* is to be seen here and, if the weather is good, the white flowers of *Saxifraga Fortunei*.

At the foot of the Laboratory Walls the first few flowers of *Iris unguicularis* may be discovered amid the untidy foliage. Trained against the wall *Cotoneaster horizontalis* is shedding the last crimson leaves, thereby fully exposing a heavy crop of scarlet berries.

FREDERICK JAMES CHITTENDEN, O.B.E., F.L.S., V.M.H.

THE death of FREDERICK CHITTENDEN deprives the horticultural world of one of the most eminent of its botanists, teachers and practical gardeners. The R.H.S. in particular has lost the most efficient and accomplished member of its staff since the days of LINDLEY and WILKS.

As one who worked happily with him for very nearly 50 years, I recall with pleasure and gratitude the blessing of his friendship and the benefit of contact with such a lovable and Christian character and the stimulation resulting from the unfailing flow of information so generously imparted to me from his encyclopædic knowledge.

CHITTENDEN was born at West Ham on October 25, 1873, and most of his childhood was spent at Leyton in Essex. He displayed an interest in plants while still a boy and living near the border of Epping Forest used to botanize there. At the age of 19 he became a teacher in his old school at Leyton and in 1900 he left to become lecturer in biology at the Essex County Council's East Anglian School of Horticulture at Chelmsford where he dealt with horticulture and bacteriology. In 1901 he married MISS ESTHER ADA FARNES. In 1902 he became a member of the R.H.S. Scientific Committee and two years later was appointed its Secretary, a post which he held till his death.

In 1907, a laboratory having been built at Wisley, CHITTENDEN was appointed as its director and as head of the School of Horticulture. At first he was single handed but was gradually joined by others. In 1908 he became, in addition, Editor of the Society's JOURNAL and was responsible for this for 31 years.

In 1919 SIR FREDERICK KEEBLE relinquished the Directorship of Wisley and was succeeded by CHITTENDEN, who then took over the control of the garden in addition to the scientific work and the training of the students. In the same year two farms were purchased, bringing the total area at Wisley up to about 220 acres, which added considerably to the responsibilities and work of the Director.

CHITTENDEN was one of the first in this country to draw attention to the problem of self-sterility in apples and pears, on which he began investigations at Chelmsford in 1902 and continued and extended them at Wisley.

On the establishment of the Laboratory at Wisley Fellows quickly availed themselves of the opportunity to obtain advice on diseases and

pests and cultural problems. This led to investigations on such things as Apple leaf-spot, rust of Cinerarias, Azalea gall, Peach leaf-curl, Celery leaf-spot, Lettuce leaf-rot and streak in Sweet Peas. Other matters investigated included the alleged benefit resulting from the artificial inoculation of leguminous crops with nodule bacteria and the influence of planting distance and "place" on the yield of crops.

Apart from his work in connection with the education of the students at Wisley, CHITTENDEN was a most active and valued member of the Examinations Board. He, more than any other one person, was responsible for the institution of the National Diploma in Horticulture which was established by the Council with the approval of the Board (now Ministry) of Agriculture in 1912, and for 27 years he acted as supervising examiner. His outstanding work for horticultural education was recognized in the 1950 New Year's Honours List by the award of the O.B.E.

When he left Wisley in 1931 he became Technical Adviser, Editor of the Society's publications and Keeper of the Lindley Library. From 1939 to 1950 he was Editor of the Royal Horticultural Society's *Dictionary of Gardening*. It is sad that he has not lived to see the publication of this great work which he had so nearly completed and to receive the kudos rising from the years of work which he had spent on it.

His earlier publications include *The Garden Doctor—Plants in Health and Disease* (1920); Papers on Fungi and Mosses in scientific Journals; reports of investigations on plant disease, pollination in orchards and other technical matters in the JOURNAL and elsewhere; the first edition of *Some Good Garden Plants* (1929); and the *Index to the Botanical Magazine* (1950).

He represented the Society in 1926 at the International Conference on Flowers and Fruit Sterility at New York and the International Congress of Plant Sciences at Ithaca, N.Y., when he took the opportunity to travel across to California, up the Pacific States to British Columbia and across Canada. He also served as one of the Society's delegates to the International Botanical Congresses at Cambridge (1930) and Amsterdam (1935); the International Congress at Berlin (1927); and the Horticultural Conferences in Vienna (1927), Paris (1932), Rome (1935) and Berlin (1938), at the last of which he was appointed Chairman of the section on the nomenclature of garden plants, a subject on which he was a recognized authority. He also visited Holland on the Society's behalf on several occasions.

One of the greatest of our present-day gardeners in a letter to me writes: "It has always seemed to me that his natural modesty caused his great ability and value to be under-estimated by quite a number of folk whom one would have expected to know better." As an example of this few realize that the invaluable discovery of the warm-water treatment for the destruction of the Narcissus Eelworm now so universally practised, arose from experiments he made while he was working at Chelmsford. MR. J. K. RAMSBOTTOM was engaged to carry out the further investigations at Wisley under the supervision of the Director which led to such a satisfactory solution of the problem.

Many living monuments of his skill and foresight in landscape gardening can be seen at Wisley, notably in the Seven Acres of which

previously little use had been made. CHITTENDEN planned this to accommodate the many shrubs and trees raised from seed sent by FARRER from Kansu and by FORREST from Western China. An old gravel pit was converted into the beautiful lake with its picturesque groupings of Weeping Willows and surrounding shrubs. The fine heath garden owes its existence to his observation of the natural and luxuriant growth of ling in small colonies on its present site. MR. FREDERICK HANBURY and I were requested by the Council to assist the Director in the creation of a heath garden but the plan and the collection of suitable plants were mainly the work of CHITTENDEN. It has remained substantially unchanged to the present day. He also initiated the trials of hardy fruits, now the National Fruit Trials, and gathered together a notable collection of rose species.

Among his natural qualities he was remarkable for his great capacity for work; meticulous accuracy in all that he wrote; remarkable eyesight which enabled him to write a small but exceptionally legible hand without glasses up to his death. He was temperate to the point of austerity and had remarkable powers of self control, possessing iron nerves and he apparently knew no fear. He bore no ill-will even when he might have considered that he had just cause; having decided what he considered to be the right course, he pursued it unperturbed by criticism and, even when that was groundless, disdained self-defence. He was a kindly man, who loved and was beloved by children; he was always willing to help those who sought his advice, and they were many. Although possessed of an encyclopædic knowledge of horticulture he felt it no disgrace to say "I don't know," an admission which he made much more frequently than the average man. He was especially fortunate in being gifted by nature with a soft and pleasant voice and particularly clear enunciation and the power of expressing himself in simple good English, often a ripple of humour mingled with the steady flow of deep knowledge. I remember an occasion when members of the Scientific Committee undertook to investigate the edible qualities of the tubers of *Tropaeolum tuberosum*. When the result was reported, most of us described it as insipid, but CHITTENDEN added "I thought the white sauce tasted very nice."

He was a great gentleman.

E. A. BOWLES.

MASTERS MEMORIAL LECTURES, 1950

THE ORIGIN AND IMPROVEMENT OF CULTIVATED PLANTS

M. B. Crane, F.R.S., A.L.S., V.M.H.

PART I

(DR. H. V. TAYLOR, C.B.E., V.M.H., *in the chair*)

IN these lectures it is my purpose, firstly, to give an account of the different ways our cultivated plants have come about, and secondly, to describe what is being done to improve them further. These two subjects are, of course, intimately associated, as the more we know of the methods by which our decorative and economic plants have originated, the better we are able to appreciate the possibilities of further improvement.

Our cultivated races of plants, like all living organisms, owe their individuality and characters to the materials they have received from their parents. The transmission of these materials from one generation to another depends normally upon the production of specialized cells—the germ-cells, and it is by the union of these cells, one from each parent, that the genes, which determine the character of the plant, are transmitted to the offspring. It therefore follows that the constitution of a plant and the way in which it has originated will be reflected in the variation of its offspring and in the mode of inheritance of its characters.

Many of our cultivated plants have been under culture from very early times and the manner of their origin is often little known. For centuries, selection was the only method that was used to improve them, and natural seedlings of selected plants were the only material from which selection was possible. Hence in these early times selection operated on the maternal side only; pollen came by chance from other individuals and there was no control of the male parent.

The discovery of sex in plants, in the eighteenth century, meant the realization that the male parent is as important as the female parent. This gave much impetus to the breeding of plants, but it was not until after the rediscovery of MENDEL's papers towards the close of the nineteenth century that the full possibilities of plant breeding became apparent. During the present century the concept of the gene as the unit or "atom" of inheritance, and the identification of the chromosomes as strings of genes, has put the whole matter in a new light. In recent times, modern methods of research, a combination of genetics, cytology, physics and chemistry, have already shown how many of our present-day cultivated plants have originated, what their ancestors were, and at the same time they have also provided us with knowledge of how new and improved plants may be obtained for cultivation in the future.

These have shown that from an evolutionary point of view we can arrange our races of cultivated plants conveniently in four classes according to their mode of origin, although the classes overlap. These classes originate as follows:

- (1) By selection from gene-mutations within a single species.
- (2) By simple auto-polyploidy, such as results from the functioning of unreduced germ-cells or from somatic duplication of the chromosomes without hybridization.
- (3) By selection from products of interspecific hybridization unaccompanied by chromosome duplication.
- (4) By interspecific hybridization accompanied by chromosome doubling or other nuclear aberrations.

Of course, selection is much quicker with hybridization than without it, and with chromosome doubling new types are produced *per saltum*. These different methods by which new kinds of cultivated plants have originated are, we believe, the principal causes of variation in nature and the processes by which evolution continues. They occur both in nature and under cultivation, and give rise to new varieties, races and species of plants.

1. *Gene mutations*

The part which gene mutations have played in the origin of new and improved varieties of plants is evident from the many new and improved plants which have appeared even within living memory. The Sweet-Pea, for example, was widely cultivated fifty years ago, but at that time no great range of varieties existed, but since then not only has the range of flower colour been greatly extended, but large differences have appeared in habit of growth, structure of leaves, and flowers. Indeed, the more attractive SPENCER form of flower with erect, large, waved petals has completely ousted the old hooded form from cultivation, and as a result the Sweet-Peas we grow to-day are as distinct from those we grew at the beginning of the present century as were the latter from the Sweet-Peas first grown in England from the seed sent by the Sicilian monk FRANCISCUS CUPANI in 1699. Similar remarks apply to the Chinese Primula, the Tomato, the Raspberry, the edible Pea and a vast number of other plants.

Such new varieties of plants have resulted spontaneously by gene-mutations; that is to say from inherent genetic changes. They are not due to hybridization, nor, as is sometimes supposed, to the direct effects of cultivation. Indirectly, however, cultivation has played an important part: first on account of the close inbreeding practised by the cultivator which reveals latent mutations; secondly on account of selection and vegetative reproduction, which enables mutations to be maintained as distinct strains or varieties irrespective of whether they have arisen through the sexual process from seeds or asexually from bud-sports; thirdly, the protection which cultivation frequently affords enables the less robust types to survive. Another important result of cultivation is that geographical and ecological barriers are artificially overcome; species which are often distantly separated in nature are commonly

brought together in gardens and plantations and this has provided opportunities for hybridization and has led to important results.

Gene-mutations, of course, always attract the plant breeder and by cross-breeding he often rapidly re-combines noteworthy new mutations with other desirable characters.

Gene-mutations have also been responsible for some remarkable plants commonly found in cultivation. Most plants, from the standpoint of genetics and inheritance, are the same all through, and consequently, when they are propagated vegetatively, it does not matter which tissue—stem, root, tuber, etc.—is used to start the new individual, or whether the tissue originates from the inside or outside of the plant; the resulting offspring are always the same, and if they are established varieties they generally reproduce themselves from seed. There are, however, a surprisingly large number of plants which do not possess this uniformity or individuality and, when they are propagated, different tissues give rise to different types of offspring. Such plants are composed of two or more genetically distinct tissues and they can be classified according to the way in which these different tissues are arranged and grow. In a common type, one genetic type or variety surrounds another, just as a glove covers a hand. Most of these plants have arisen by gene-mutation occurring in the somatic, or body tissues, in such a way that only certain layers which go to make up the plant are affected by the change. Now, many plants can be propagated by root cuttings, and by adopting this and kindred methods their exceptional make-up has been demonstrated, as buds from roots which grow up to form shoots and new plants usually arise from the internal tissues. By propagating *Bouvardias* in this way BATESON (1916) found that root-cuttings of the pink-flowered variety 'Bridesmaid' produce the red-flowered variety 'Hogarth.'

Many varieties of Potatoes are of the same class and their chimerical structure was first demonstrated by ASSEYEVA in Russia (1927) by a different but equally simple method, viz. by removing the eyes of the tubers and thus stimulating the internal tissues below the excised eyes to form buds and shoots. The variety 'Golden Wonder,' which has a thick brown russet skin, contains internally the variety 'Langworthy,' which has a thin white smooth skin. Chimerical plants, such as these, often present a problem to the plant-breeder, for the external glove-like variety may have a thickness of one or more cell layers. Now the reproductive cells of plants are generally formed from the sub-epidermal or second layer; hence the germ-cells—the egg-cells and pollen—will be of the kind of which this layer is composed. Thus the thick brown russet skin character of the Potato 'Golden Wonder' is genetically only skin deep; as a result the germ-cells are all 'Langworthy,' and in sexual reproduction the russet character is not passed on and the offspring are all smooth. 'Langworthy' was known before 1876 and 'Golden Wonder' was first distributed in 1906, and it is clear that the latter arose as a somatic mutation, or in other words as a bud-sport from 'Langworthy.'

The occurrence of bud-sports in plants has for long attracted the attention of the horticulturist and plant-breeder alike. They affect all kinds of characters such as leaves, habit of growth, colour of fruit and

flowers and so on. But many of them are of the same fantastic make-up as the 'Golden Wonder' Potato, and where the bud-sport is the result of a change in the epidermal layer only, it can only be increased and maintained by asexual reproduction. To further demonstrate the significance of this to the plant-breeder I will refer to an experiment by CLAUSEN and GOODSPEED (1923). They crossed two varieties of *Nicotiana*, one with carmine and the other with white flowers. In this cross carmine is dominant to white and the F_2 generation approximates to the dihybrid expectation of 9 carmine : 3 pink : 4 white. In the F_1 generation 200 plants were raised and all had carmine flowers except one. This exceptional plant was divided into two parts, one having carmine and the other bright pink flowers. A genetic analysis was made of two parts by appropriate breeding investigations, and the following gives the results obtained:

Parents	Carmine	Pink	White	Total
Carmine selfed . . .	48	13	39	100
Pink selfed . . .	56	13	31	100
Expectation 9 : 3 : 4 . . .	56·25	18·75	25	100
Back-crosses:				
White × Carmine . . .	54	29	64	147
White × Pink . . .	40	37	72	149
Expectation 1 : 1 : 2 . . .	37	37	74	148

Plants were raised from stem-cuttings from both parts of the plant, and the two clones raised were uniform for carmine and pink flowers respectively. Plants were also raised from root-cuttings of both the carmine and pink clones, and the plants obtained from all produced only carmine flowers. This behaviour in vegetative propagation and the above breeding results show that the change resulting in the pink-flowered bud-sport was only skin deep and did not involve the second layer from which the germ-cells—the ovules and pollen—are derived.

The albo-marginate variegated varieties which occur in *Pelargonium* and other plants have a green core and white outer layers. Others have a white core and green outer layers. In many the two outer layers are white, and in others, in the reverse condition they are green. Hence, when self-pollinated, those with white outer layers give only white seedlings, and root cuttings all green plants. In the same way in the reversed make-up—green over white—the seedlings are all green and root-cuttings white.

Chimaeras of this kind have also arisen spontaneously following the horticultural practice of grafting. They have occurred in this way in Apples, Roses, Medlar, Cytisus and other plants. They have also been deliberately produced by grafting (see Figs. 223, 224 and 225).

I have dwelt at some length on the subject of bud-sports, as they often intrigue the horticulturist and especially those who breed plants. Sports affecting the colour of flowers and other characters are common in Chrysanthemums, Dahlias, Roses and many other plants. They are

usually readily maintained by vegetative propagation, but as we have seen, their use in further breeding work depends upon whether or not the change involves the germ-tract.

2. *Auto-polyploidy*

The second mode of origin, a simple doubling of the chromosome number has given, and is continuing to give, us many new plants. Most varieties of Raspberries have fourteen chromosomes, but 'Belle de Fontenay,' 'Merveille Rouge' and several others have twenty-eight. They have arisen from the fourteen chromosome kinds during the past eighty years. In the Chinese *Primula* there are varieties with twenty-four chromosomes and others with forty-eight. The latter have larger flowers and sturdier growth and arose from the twenty-four chromosome forms spontaneously at the beginning of the present century.

In quite recent times two new large forms of Pears have arisen as bud-sports, one in this country and one in America. They have larger fruits and twice the usual number of chromosomes, namely sixty-eight instead of thirty-four. These are examples of new races of plants which have arisen from a complete duplication of the chromosome number. Sometimes as in *Primula*, they have come about through the sexual process, the germ-cells having a double number of chromosomes; and sometimes, as in the Pear, vegetatively, a double number of chromosomes occurring in the somatic or body cells.

Many varieties of plants have one and a half times as many chromosomes as their parents, not twice as many as in the new *Primulas* and Pears. Thus Apples are of two kinds. Some, the diploids, have thirty-four chromosomes (two sets of seventeen), and others, the triploids, have three sets with fifty-one chromosomes. The latter arose from the union of a normal reduced germ-cell with seventeen chromosomes and an unreduced germ-cell with a double set, thirty-four. Many other horticultural varieties of plants are triploids and of a similar origin. For example, such important varieties of garden Tulips as 'Keizerskroon,' 'Massenet' and 'Pink Beauty' are triploid; many widely grown varieties of the garden Hyacinth are also triploid of a similar origin. The first to appear was 'Grand Maître' in 1870. Other outstanding triploid varieties are 'General de Wet,' 'King of the Blues,' 'Queen of the Pinks,' 'Lord Balfour' and 'Lord Derby.' On account of their inability to breed true, triploids and other odd-numbered polyploids are in horticulture naturally confined to species that are reproduced asexually, as by bulbs, corms, grafting, etc. Nevertheless among the triploids we find many important varieties. Thus in Apples the properties of the triploid 'Bramley's Seedling,' its hardy constitution, high vitamin C content, and admirable cooking qualities are reflected in the position this variety holds in the Apple population of this country. 'Belle de Boskoop,' another triploid, is one of the most popular Apples on the continent of Europe. 'Ribston Pippin,' one of the richest flavoured Apples, 'Blenheim Orange,' one of the best all-round Apples in cultivation, and 'Gravenstein' and 'Reinette du Canada,' are other notable triploids.

A further example of flower improvement due to polyploidy occurs in *Narcissi*. In the Trumpet *Narcissi* such old varieties as 'Henry

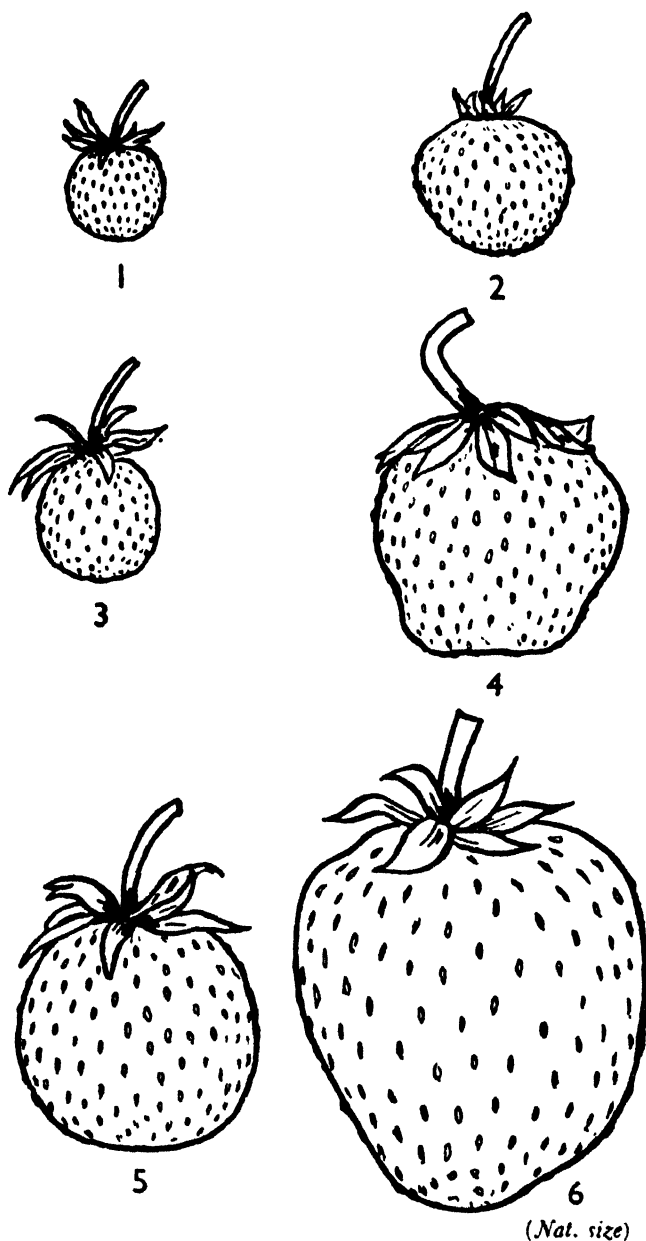
Irving' and 'Golden Spur' are diploid with fourteen chromosomes, the larger flowering 'Emperor' is triploid with twenty-one, and the even larger 'King Alfred' is tetraploid with twenty-eight. In recent times polyploid forms have been found in *Nerine*, and as a result it is probable that new and improved forms will soon appear in this genus.

3. *Interspecific hybridization*

The third process or mode of origin which has led to improvement in our garden plants has been by interspecific hybridization unaccompanied by chromosome duplication or other major cytological aberrations. This has occurred from hybridization both between diploid and between polyploid species. Three species of *Ribes* appear to have entered into the constitution of the garden Red Currant, namely *Ribes vulgare*, *R. rubrum* and *R. petraeum*. Some cultivated varieties are predominantly *vulgare*, others *rubrum* and others *petraeum*. Some again combine the characters of one or another pair of these species. All the species and varieties appear to be diploid. They have sixteen chromosomes, two sets of eight.

The development of the garden Strawberry is another example which shows how new and important plants have come about by selection from the offspring of species-crosses without the direct intervention of chromosome doubling. The cultivation of the Strawberry in Europe goes back to the fourteenth century. At that time only the wild wood Strawberry, *Fragaria vesca*, was grown under cultivation. *F. elatior*, found sporadically in the woods on the continent of Europe, and *F. virginiana*, the woodland and hedgerow Strawberry of eastern North America, were brought into cultivation in the sixteenth and seventeenth centuries respectively. The fruits of all three species are small, and at that time no appreciable increase in the size of fruits had occurred under cultivation. Early in the eighteenth century a fourth species, *F. chiloensis*, with large fruits, was introduced into Europe from South America. *F. chiloensis* is a dioecious species, *i.e.* its male and female flowers are on different plants. Unfortunately all the plants introduced were female, and for a long time, owing to the absence of pollen, no fruit was obtained from them. Later some of the plants were grown near other Strawberries such as *F. elatior* and *F. virginiana*. These pollinated the *chiloensis* plants and satisfactory crops developed. The fruits though large were poor in colour and quality, but seeds from them, the result of crossing with *F. virginiana*, were the beginning of our modern race of Strawberries. The first varieties of this type, combining the larger size of *F. chiloensis* with the aromatic qualities of *F. virginiana*, appeared in France towards the end of the eighteenth century. It was not, however, until the early part of the nineteenth century that any considerable progress was made. At this time the English horticulturists took the lead and the advance they made was due to the raising of plants from seed and deliberate cross-breeding.

The genus *Fragaria* has been critically studied and the chromosome number of the different species determined. The details given in Text Fig. 1 make the story clear. Experiments have shown that crosses between the species with different chromosome numbers (see Text Fig. 1),



Text Fig. 1.—The origin and development of the garden strawberry.

	Chromosome number	Period
1 <i>Fragaria vesca</i>	14	1300—
2 <i>Fragaria elatior</i>	42	1500—
3 <i>Fragaria virginiana</i>	56	1600—
4 <i>Fragaria chiloensis</i>	56	1700—
5 Keen's Seedling	56	1821—
6 Royal Sovereign	56	1892—

such as *F. vesca* \times *F. elatior* and *F. elatior* \times *F. virginiana* or *F. chiloensis*, are abortive or result in sterile hybrids, but crosses between species with the same chromosome numbers, such as *F. virginiana* \times *F. chiloensis*, result in fertile offspring. Thus the development of the garden Strawberry subsequent to the introduction of new species into Europe depended on the hybridization of the two fifty-six-chromosome species which until then had been geographically isolated.

Amongst the many other genera in which species hybridization, without chromosome doubling, has given rise to new races of cultivated plants may be mentioned *Dianthus*, *Streptocarpus*, *Rubus* and *Vitis*. In the genus *Iris*, *I. chamaeiris*, *I. olbiensis*, and *I. sub-biflora* have 40 chromosomes and *I. mesopotamica* and *I. trojana* have 48. Other species such as *I. albicans*, *I. germanica* and *I. Kochii* have 44 chromosomes, and as RANDOLPH (1935) suggests, it is probable that the species with 44 chromosomes arose from hybridization between species with 48 and 40 chromosomes.

4. Hybrid-polyploids

The fourth and perhaps the most important way in which new forms have arisen is by inter-specific hybridization in which unreduced germ-cells have taken part, or where somatic duplication of the chromosomes has subsequently occurred. As before, there is sometimes complete duplication and sometimes unilateral duplication, *i.e.* non-reduction of the germin-cells of one parent only.

The species of Dahlia, excepting the garden Dahlia *D. variabilis*, are tetraploid, with thirty-two chromosomes, and they can be divided into two classes: (a) where the anthocyanins are cyanidin types and the flowers magenta, and (b) where the anthocyanins are pelargonidin types and the flowers scarlet or orange. The garden Dahlia, *D. variabilis*, combines the pigments of the two classes, and it also has twice as many chromosomes, sixty-four. Combined genetical, cytological and chemical studies (LAWRENCE and SCOTT-MONCRIEFF, 1935) have convincingly led to the conclusion that the octoploid *D. variabilis* with its wide range of colour and form arose in nature from hybridization between the two types of tetraploid species accompanied by chromosome duplication.

Our European Plum, *Prunus domestica*, has probably arisen on many different occasions from hybridization between diploid and tetraploid species, followed by chromosome duplication to give the fertile hexaploid *P. domestica*. Indeed the results of breeding and cytological investigations with species and varieties of *Prunus* have all led to the conclusion that the diploid Cherry-Plum *P. cerasifera* with sixteen chromosomes, and the tetraploid Sloe *P. spinosa* with thirty-two, are the ancestral species of the hexaploid *P. domestica* with forty-eight chromosomes (CRANE and LAWRENCE, 1947). This view is supported by a consideration of the variation which occurs within these species; thus, in *P. cerasifera* the ground colour of the fruits is yellow and the anthocyanin red. In *P. spinosa* the ground colour is green and the anthocyanin blue, and the range of variation in both species is limited. In *P. domestica*, however, both red and blue colours and also yellow and green grounds occur, and from their various recombinations an infinitely wider range

of variation results. The increase in size and wider variation in form and flavour of the fruits of *P. domestica* is also in agreement with this view (Fig. 226). Normal hybrids between the two ancestral species are triploids with twenty-four chromosomes, three sets of eight: they are highly sterile and are still to be found in nature. The cultivated garden Plums which have forty-eight chromosomes, twice as many, are highly fertile (DARLINGTON, 1928-33).

Although precise details are not known, it is generally agreed that the pink-flowered Chestnut *Aesculus carnea* arose from the hybridization between two distinct sections of the genus, namely the common Horse Chestnut *A. Hippocastanum* of Europe and Asia, which makes a tree up to 100 feet high, and *A. Pavia* from North America, a comparatively small shrubby species, which only attains a height of about 12 feet. Several other well-marked characters separate *A. Hippocastanum* from *A. Pavia*. The fruits of the former are very spiny and the flowers usually have five petals with a patch of colour confined to the base. In *A. Pavia* the fruits are smooth and the flowers only have four petals, which in contrast to those of *A. Hippocastanum*, are richly coloured and glandular at the margins. *A. carnea* is in many respects intermediate between the above two species; it makes a tree 50 to 70 feet high and its fruits are only slightly spiny. In habit of growth and foliage it resembles *A. Hippocastanum*, whilst in the colour of its flowers and glandular edged petals it approaches *A. Pavia*. Both *A. Hippocastanum* and *A. Pavia* have twenty pairs of chromosomes whilst *A. carnea* has forty pairs. Breeding experiments have been also carried out with *A. carnea* and the taxonomic, genetic and cytological studies all confirm its hybrid origin.

Amongst other horticultural plants which have arisen from inter-specific hybridization accompanied by chromosome duplication are the Loganberry, the Veitchberry, the Foxglove *Digitalis mertonensis*, *Delphinium Ruysii* and *Primula Kewensis*. *Brassica oleracea*—the Cabbage, Brussels Sprouts and Cauliflower group of *Brassica*—has eighteen chromosomes. *B. rapa*, the Turnip group, has twenty. The Swedes (*B. rapa-oleracea*) have thirty-eight (CRANE & THOMAS, 1942-43). The latter are composed of double hybrids from the other two—and so this story could be continued to show how many other plants, including our bread-wheats and oats, have originated in a similar way, how they excel their ancestors, and how these occasional “accidents” in the course of reproduction have bestowed enormous benefits on mankind.

(To be concluded)

INVEREWE : A GARDEN IN THE NORTH WEST HIGHLANDS

Mairi T. Sawyer

IT is with some diffidence that I write about my garden here at Inverewe, because I feel my collection of rare plants is very small compared with those of better-known places elsewhere.

During the summer months hundreds of visitors wander through my gardens. Almost everyone expresses surprise at finding them here at all and is amazed to see what trees, plants and shrubs flourish. Having motored, cycled or walked through many miles of peat-hags, bogs and wild rocks, they realize what this estate must have been like when my father, Osgood Mackenzie, bought it in 1862. (Fig. 212.)

He has described the gardens and their favourable position in his book *A Hundred Years in the Highlands*, first published before he died in 1922 and recently issued in a new edition. There he tells how the proximity of the Gulf Stream provides the required warmth and almost entire lack of frosts; and how he could grow, as we still can, many and as good plants at Inverewe in the open air as is possible at Kew under glass. I myself have a feeling that our weather is now more severe than it was even in his younger days, which only bears out his opinion, expressed thirty years ago, that the consistently mild climate here is a thing of the past. Or maybe, having known them for so long, I now feel more acutely the effects of storm and tempest on my beloved trees and plants.

Nevertheless, much can still be accomplished in this remote little corner of Wester Ross, just north of Gairloch. It is interesting how of late more and more people, English and Scots, seem to be settling on our west coast. Some of them buy shooting lodges, others take derelict croft houses and improve them; all, it seems, have an urge to get away from the madding crowd.

Most of those people first become acquainted with this country in the Spring or Summer, and do not realize what gales and pelting rain will come during the rest of the year. The everlasting hills and ever-changing sea are always there, but as time goes on they may feel that a belt of trees for shelter, some attractive shrubs around their home, and an interesting garden would be a great joy. If I can impress on them that with knowledge and perseverance it can be done, as it was here, I shall indeed be glad.

The enclosed ground round the mansion here (usually called "the policies" in Scotland from the old French word "police") consists mostly of steep braes facing south and west, with the exception of a narrow strip of land down by the shore. On this strip, an old sea-beach, which is the only piece of coastline free from rocks, my father created the orchard and vegetable and flower gardens some eighty-five years ago.

The Inverewe peninsula, whose Gaelic name, Am Ploc ard (the high lump) so aptly describes it, consists of a mass of red Torridonian sandstone, and where the rock slabs were not bare, they grew short heather and still shorter crowberry. The only soil was the rawest, acid black peat, varying from an inch to two or three feet in depth; and much of the peat had been dug out in hollows for fuel by the crofters who occupied the place forty years before my father bought the estate.

There was nothing approaching decent soil on any part of the peninsula, hardly any gravel or sand, but in places there was a jumble of rotten rock. One redeeming feature about what must otherwise have seemed a hopeless situation for planting was that the rock was not solid, but broke up easily, and in places showed veins of pink soft clay. In some places my father had to import soil which he paid an old man to bring in creels on his back.

Because of its exposed position, the Ploc ard catches nearly every gale that blows. With the exception of the thin low line of the north end of Lewis, forty miles away, there is nothing between us and Labrador, and the peninsula is continually being soused with salt spray. The braes above the house are somewhat better, but even they are swept by the south-westerly gales which are so constant and so severe on this coast.

When my father, who had inherited a love of trees and flowers from his father and grandfather, the Lairds of Gairloch, started his planting, there were no trees or shrubs in sight except one tiny bush of dwarf willow, about three feet high. This was always preserved as a curiosity, and I can well remember as a child showing it to visitors.

His first task was to run a deer and rabbit fence right across the peninsula. He always told me that if he had known then the value of the dwarf *Pinus montana* he would have begun by planting a thick belt of them among the rocks just above high water mark, to break the violent squalls of salt spindrift. However, Corsican pine and Scots fir on the outside proved very successful and he was fortunate in acquiring some of the really good old stock of Scots fir, similar to those which grow so resplendently along the shores of nearby Loch Maree and in the fine glens of Locheil.

Thick hedges of *Rhododendron ponticum* were planted, also birch, oak, mountain ash, service, larch, beech and Douglas fir trees. To these were added *Abies Alberti*, *Picea nobilis*, *P. Pinsapo*, *P. lasiocarpa* and *P. Nordmanniana*, *Cupressus macrocarpa* and *C. Lawsoniana*, *Thuja gigantea*, bird-cherries and, in the specially deep nooks, Wellingtonias; these last requiring imported soil.

After about fifteen years had passed, he was so encouraged by the good results that he dotted about Eucalyptus and some of the best natural species of *Rhododendron*, also *Pinus insignis*, the Monterey pine, of which a very fine specimen grows on the sea-shore in front of the house, with its "toes" in the salt water. I understand that it loves a similar position in its home in California.

All these trees have grown to an amazing size, and twining on many of them to-day are creepers from different parts of the world, including *Billardiera longifolia* from Tasmania, with its wonderful large blue berries, *Berberidopsis corallina*, the coral plant of Chile; *Clematis Armandii*, *indivisa lobata*, *alpina* and *tangutica*; *Eccremocarpus scaber*, *Hydrangea petiolaris*, (ascending to fifty feet up a larch tree), and other climbers.

In addition to the protection afforded by the trees from the wind and salt spray, they undoubtedly provide a useful canopy for conserving the rain, releasing it slowly so that it does not erode the soil but keeps it permanently moist with a good mulch as well; for it must be remembered that our rainfall here averages nearly sixty inches in the year. It may be

also that the trees help to provide the shrubs and plants with that equability of temperature which is so dear to them. (Fig. 222.)

Many of the trees, of course, not only act as hosts for some of the climbers but also as a background for the shrubs and plants which grow among them. The common silver birch can be particularly beautiful, notably around the rhododendrons, and I am always careful to maintain their trunks by ruthlessly eliminating those which develop too much black bark.

The red Torridonian sandstone, appearing sometimes in large slabs, provides a further pleasing background for the shrubs and plants. In many places it is only too near the surface of the ground so that some of the larger trees have a precarious hold on the shallow soil in which they have their roots.

For those who should visit these gardens, it may be of interest to note some of the plants to look out for. On entering the wrought-iron gateway, the Gate Lodge (1),* seen on the right, has two large *Tricuspidaria lanceolata*, one facing east and one west, intermingled with 'Paul's Scarlet' climbing rose, *Passiflora coerulea*, *Solanum crispum* (autumnal) and *Ceanothus Burkwoodii*.

On the right-hand side of the drive (2) are banks of Hydrangea, *Erica mediterranea*, white and blue Agapanthus (*umbellatus*) (Fig. 218), Yuccas, Azalea (*mollis* and 'Ghent' hybrids) with *Lilium giganteum*. Behind these are very high *Rhododendron arboreum*, *Falconeri*, *fulgens*, *Thomsonii*, 'Elsae', *oreotrephes*, *Aucklandii*, while here and there among them are *Eucryphia* (*cordifolia* and *glutinosa*) (Fig. 221), Prunus, and Camellias.

One of the Camellias is thought to be a hundred and eighty years old. At the time this estate was bought, there was a sale near by at old Dundonnell House. The aged gardener produced, from a small lean-to greenhouse, a tub containing a small green shrub which he said had never thriven, although it was over eighty years old. My father bought it for a shilling: it flourished and is covered every year with tight rose flowers—very different from the present-day semi-double camellias.

There is one exceptionally high Austrian fir on which a *Clematis montana rubra* has climbed to a height of thirty feet, and when in blossom can be seen from afar, spreading its starry rose-coloured flowers over the flat branches of dark green needles.

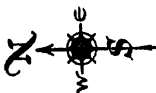
On the left side of the drive is a hedge of clipped *Rhododendron ponticum*, over which *Tropaeolum speciosum* ramps, making a blaze of scarlet blossoms and royal blue berries during the months of August and September.

At the back of this hedge is a thirty-six foot drop into the orchard and kitchen garden (19). Against its terrace wall grow various climbing roses, *Ceanothus*, *Mutisia decurrens*, *Correas*, *Callistemons*, *Cassia corymbosa*, *Habrothamnus* and *Cestrum elegans*.

At the west end of the drive (3) are banks of *Phormium tenax*, *atro-purpureum* and *aureo-striatum*, together with *Acanthus latifolius*, *Kniphofia grandiflora*, *Libertia formosa* and *ixioides*. Down the steps, on the western side of the entrance to the kitchen garden (18), before the arched doorway, is a large bed of one of the most striking plants, *Myosotidium nobile*, with its large round leaves of vivid green and huge heads of

* These figures refer to the numbers marked on the plan given on p. 439.

A detailed geological map of the Tully area. The map shows various geological features and labels. The labels include 'Tully', 'Dunlop', 'Auchincloss', 'Widdowson', 'Muller', and 'Muller'. A scale bar at the bottom indicates distances from 0 to 10 miles. A north arrow is located in the bottom right corner.



cerulean blue flowers. Although its home is in the far Chatham Islands, off the coast of New Zealand, it is perfectly happy here. I have often told the story of how it never thrived until one day I saw a letter in *The Times* from a sailor who had seen this giant forget-me-not on the shores of the Chatham Islands, growing in rotten seaweed and sharks' carcasses. It took little time for me to collect seaweed off the adjacent shore and herring-fry from the ebb-tide; and soon after the plants were surrounded with these, they began to flourish. (Fig. 227.)

On the mansion house itself (4) and the low walls in front are various climbing roses and magnolias, *Myrtus communis*, scarlet *Clianthus magnificus*, *Ceanothus Burkwoodii*, *Ceratostigma Wilmottiana*, *Cydonia* (*Chaenomeles*) *Maulei* and *cardinalis*, *Correa Harrisii*, and *Teucrium latifolium*.

On the south side of the paved terrace runs a curved herbaceous border, then the wide lawn down to a steep slope (5) to the sea. This slope I can hardly call a rock garden, but in its pockets are Alpine Phloxes, Cistuses, and *Dierama pulcherrima* waving above *Campanula bellidifolia* and *Geranium Farreri*. Clumps of *Habranthus pratensis* make a good blaze, beside *Anemone tetrasepala* and *pulsatilla*. (Fig. 214.)

At the lower right-hand corner is a large bed of *Crinum Powellii*, white and rose; whilst *Lewisia Heckneri* peeps out from under big stones, along with *Ramondia pyrenaica*. In the sunniest pocket the lovely *Rhodohypoxis Baurei* holds its own. Alas, it does not grow as I saw it many years ago, in sheets of cherry and white side by side, on a wild hillside of the Drakensberg mountains in Natal. Nothing could have been more beautiful. This bank down to the seashore is a real Russian salad of plants, but it holds a good many treasures.

Passing from the lawn to the west, a path takes one to a small enclosure known by me and my gardeners as "Japan" (6), simply because the first thing planted there was a very good rose-coloured double cherry, which was sent to my father by a friend in Japan. The cherry, now a huge tree, is in the centre of the enclosure, and at both ends are very tall palms, *Chamaerops excelsa*. (Fig. 219.) On one, seventeen feet high, climbs *Mitraria coccinea*, and on the other *Philesia buxifolia* grows quite seven feet up on the hairy stem. The palm does not seem to mind in the least, and certainly the *Philesia* does very well and its waxy flowers hang charmingly round the trunk.

In this enclosure two eleven foot high tree ferns (*Dicksonia antarctica*) wave their giant fronds (Fig. 217), and there is perhaps the largest *Tricuspidaria lanceolata*, nearly thirty feet high and ninety-three feet in circumference. Below this grow *Lilium auratum*, tree Peonies, Iris, *Fabiana imbricata*, *Calceolaria violacea* (a lovely plant, growing in the form it does here) *Echium fastuosum*, and an immense *Kniphofia* which grew to over six feet among wild rocks and moss on the hillsides in Natal.

Camassias, American Erythroniums (rose and yellow) and *Narcissus nanus* seem to have taken possession of this corner, for there are sheets out, each in its own time. Returning to the west side of the house (7), below a ninety-eight foot *Eucalyptus coccifera* grows *Phygellus capensis*, also very happy in Ross-shire.

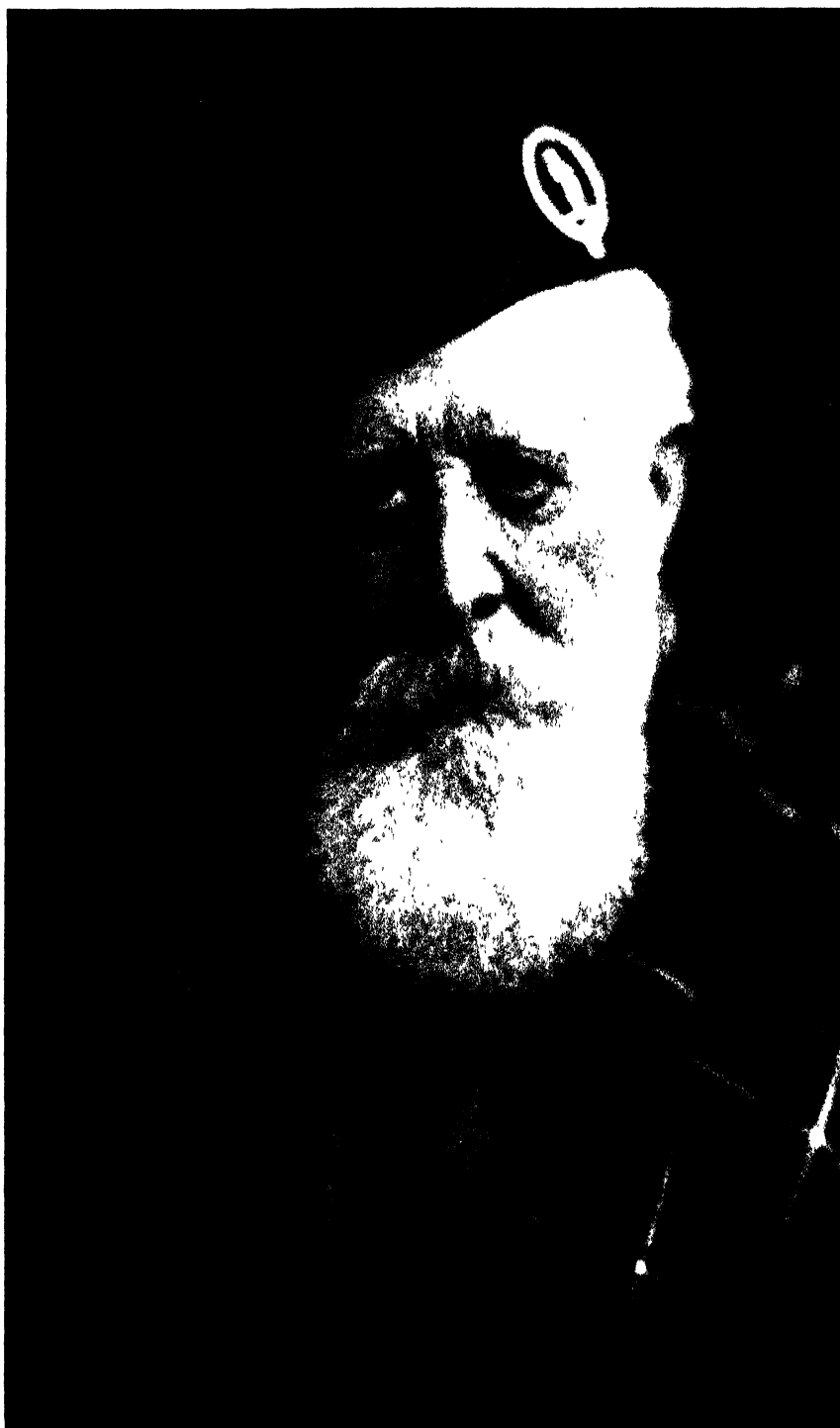
Following the path westwards, one passes beds of *Rhododendron luteum* (*Azalea pontica*), the sweetest-smelling of all, mixed with the



Celan Photo, M. W. Lophinstone, I R P S

A GARDEN IN THE NORTH WEST HIGHLANDS

Fig. 211- A pond at Inverewe (See p. 441)



Photo, Andrew Paterson

INVEREWE

Fig. 212 Osgood Mackenzie, the author's father, who founded the garden
(See p. 436)



Fig. 213 -F J Chittenden, O.B.E , F.L.S., V.M.H. (See p. 424)

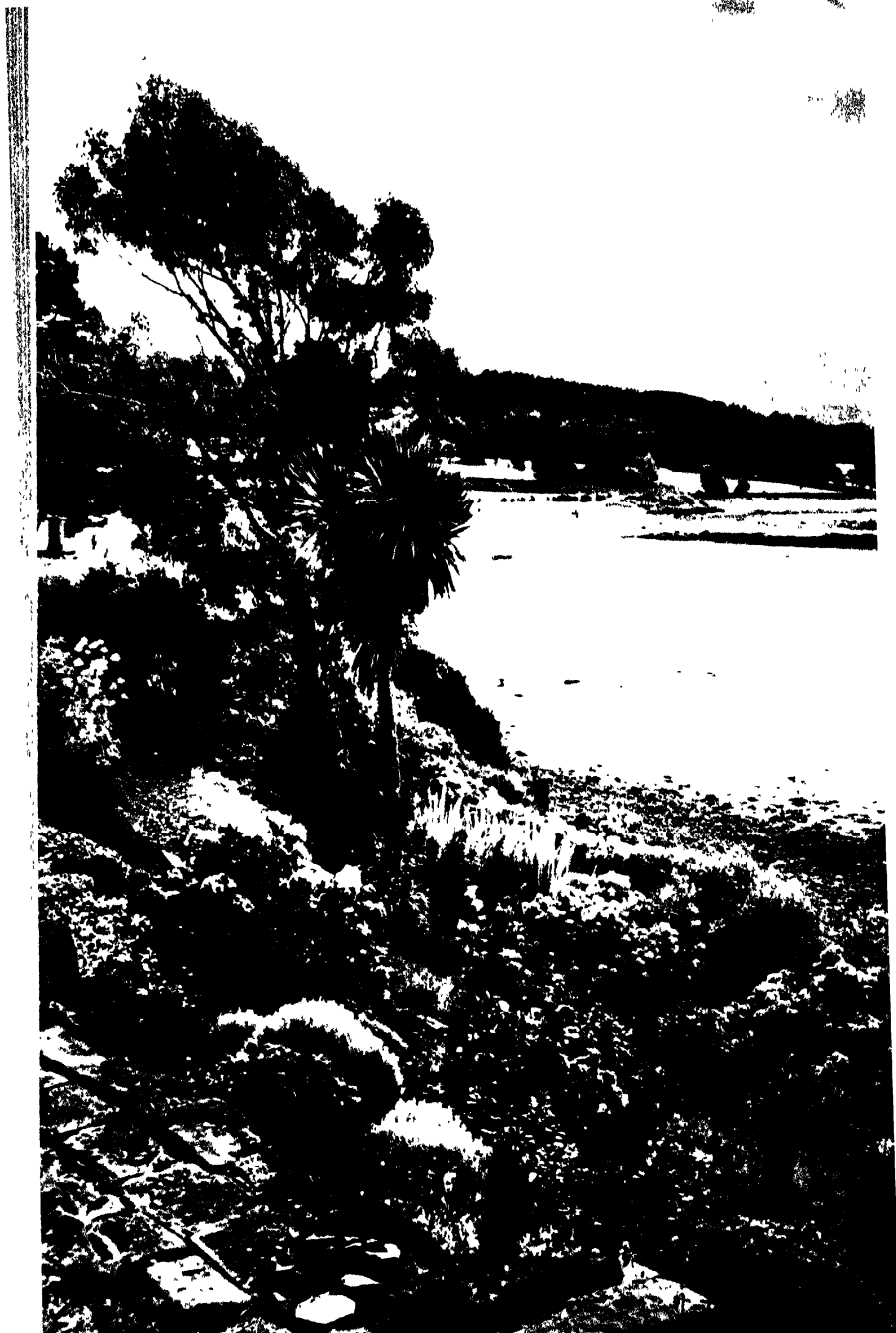


Photo. R. Adam

INVEREWL

Fig. 214 - The garden and view from the front towards the Latterewe Deer Forest (See p. 440)



Photo, R. Adam

INVEREWE

Fig. 215-- View looking north from the gardens over Loch Ewe. (See p. 441)



Fig. 216—*Rhododendron sinogrande* (See p. 442)

Photo, P. M. Svinge

Photo, R. Adam



INVEREWE

Fig. 217—A tree fern, *Dicksonia antarctica* (See p. 440)

Fig. 218 — *Agapanthus umbellatus* (See p. 438)



Photo, R. Adam



Photo, R. Adam

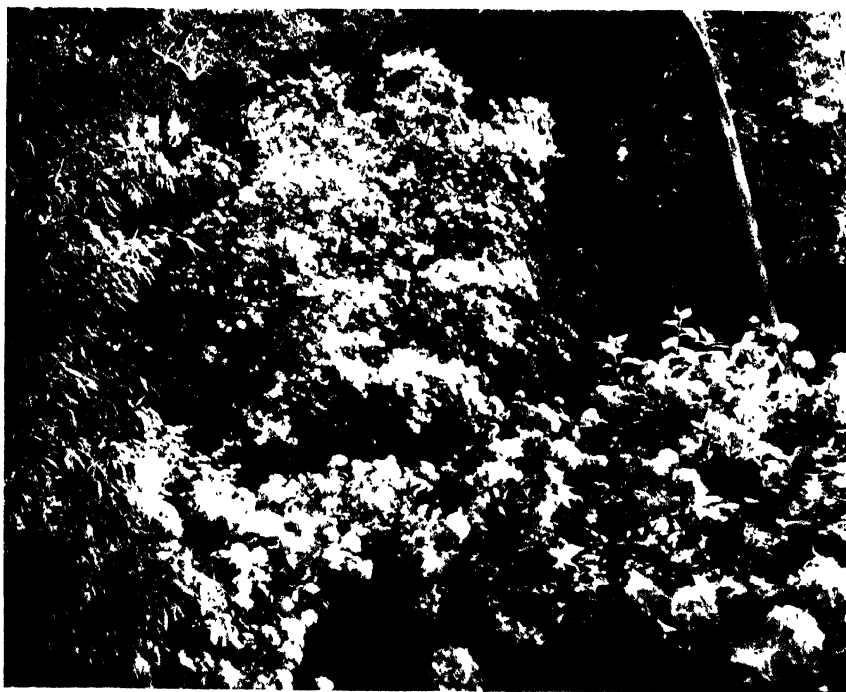
INVEREWE

Fig. 219 — *Chamaecrops excelsa* (See p. 440)



Photo, R. Adam

Fig. 220—*Rhododendron campylocarpum* among the birch trees (See p. 441)



Photo, R. Adam

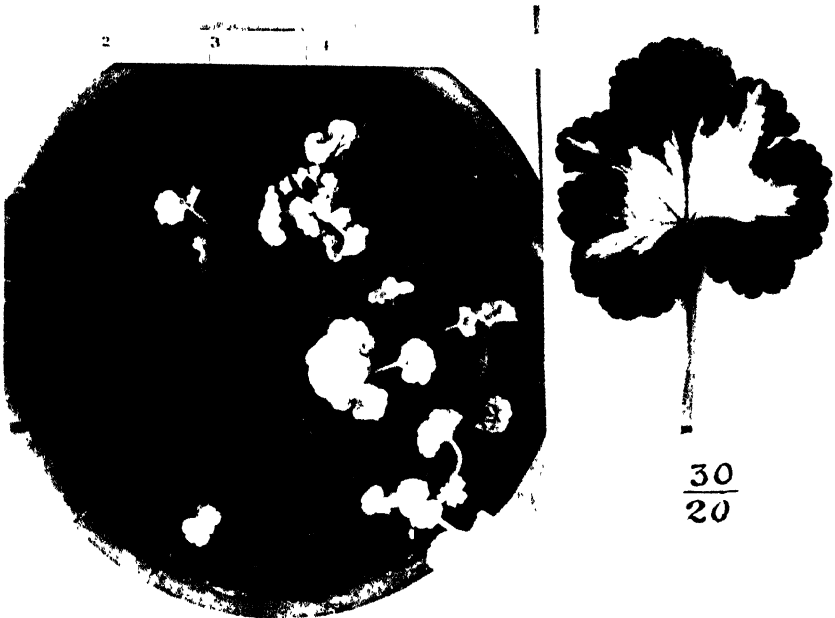
INVEREWE

Fig. 221—*Eucryphia glutmosa* (*pinnatifolia*) and *Hydrangea* hybrids (See p. 438)



INVERIWE

Fig. 222--The Inverewe Peninsula from across Loch Ewe showing the growth of trees (See p. 438)



THE ORIGIN AND IMPROVEMENT OF CULTIVATED PLANTS

Fig. 223--Green over white Pelargonium showing all white root cuttings. The plant has been potted upside down with the roots on the surface of the soil and buds and shoots formed from the roots (See p. 430)

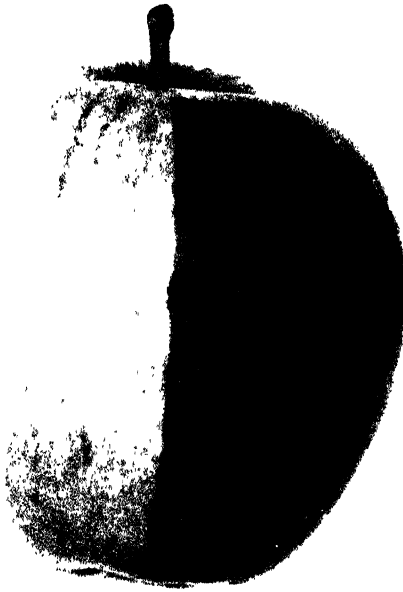
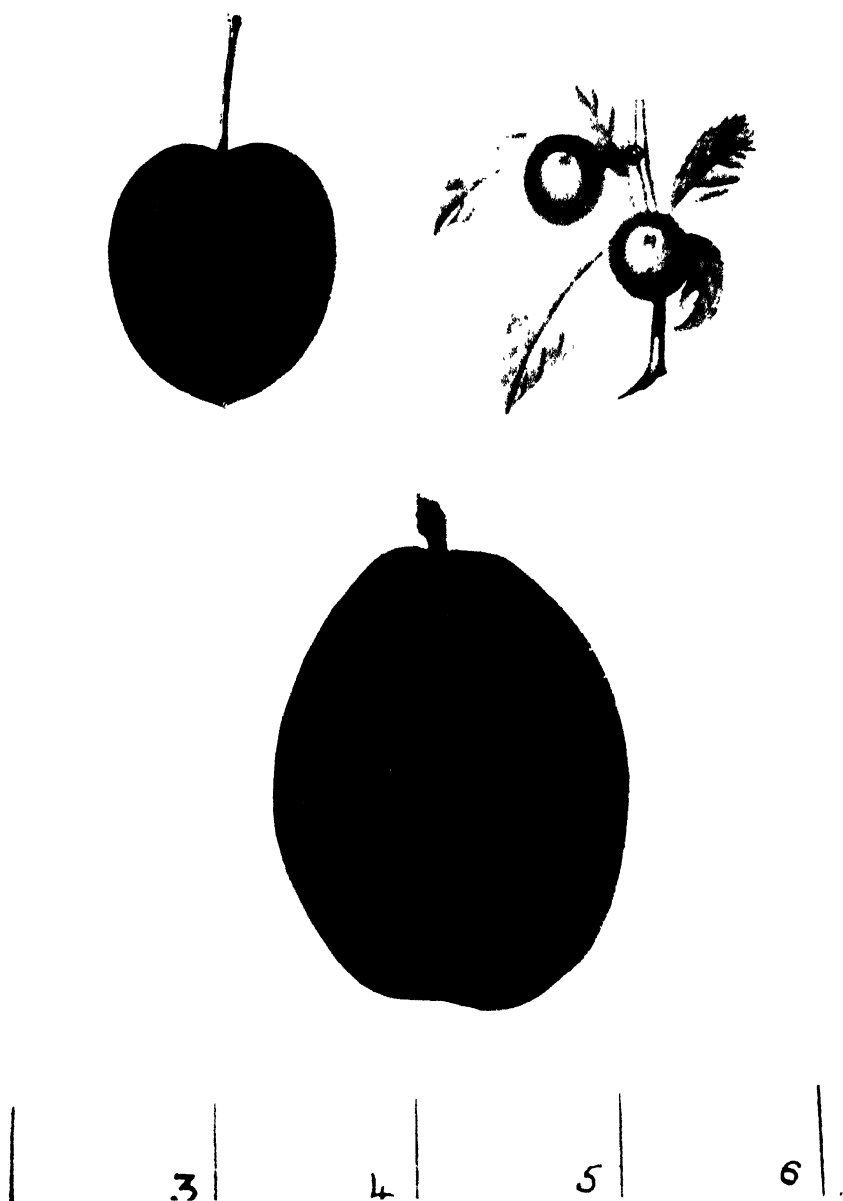


Fig. 224—Apple. On the left-hand side the variety 'Ellison's Orange', on the right-hand side 'Worcester Pearmain' over 'Ellison's Orange'. Arose spontaneously from grafting 'Worcester Pearmain' on to 'Ellison's Orange' (See p. 430)

THE ORIGIN AND IMPROVEMENT OF CULTIVATED PLANTS

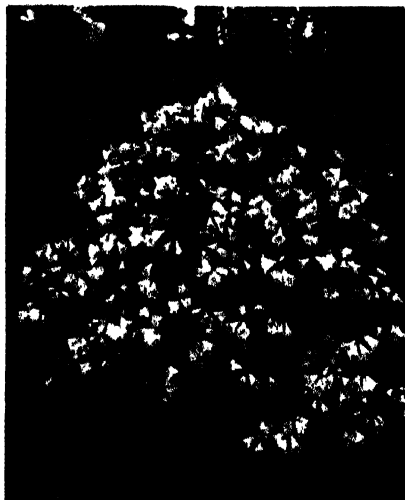
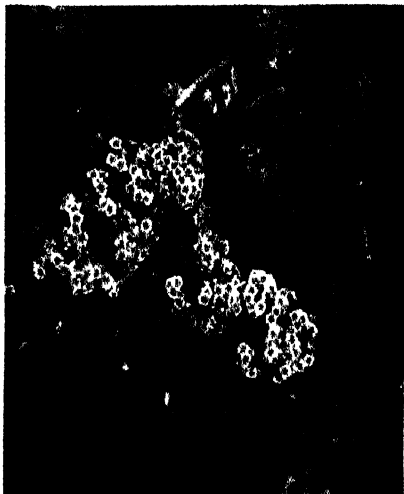


Fig. 225—A deliberately produced chimæra. One layer of *Solanum nigrum* over tomato (After Crane and Jørgensen, 1927) (See p. 430)



THE ORIGIN AND IMPROVEMENT OF CULTIVATED PLANTS

Fig. 226 The origin of the garden Plum. (1) *Prunus crassifera* (left), (2) *Prunus spinosa* (right) (3) *Prunus domestica* (bottom) (See p. 435)



Colour Photos, J. C. Gilchrist



Colour Photo, M. W. Elphinstone, F.R.P.S.

INVERWE

Fig. 227-- (top left) *Myosotidum nobile* (See p. 440)

Fig. 228-- (top right) *Rhododendron* 'Countess of Haddington' (See p. 442)

Fig. 229-- (bottom) *Watsonia Beatrice* (See p. 443)

Rhododendron 'Royal Purple.' Further along on the left there is a small pond (8), in which a lovely wedgwood-blue Iris (Chinese, I believe), grows right in the deep water. Round this pond are many rhododendrons of great interest, including two *sinogrande*, small compared with the others, but covered with fat buds this year.

On the left of the main path is a natural rock garden (mostly in a face of Torridonian sandstone) which is really only in the making, but promises to be interesting. In front of it is a large bed of *Myosotidium nobile*, and above lots of the Canadian lily, *Lilium pardalinum*, a glorious scarlet, with a groundwork of blue *Cynoglossum*.

Returning to the main path, various rhododendrons are passed, until one comes to the top of the water garden (10), which is a wild but very lovely mass of Azaleas (*mollis* and Ghent hybrids), *Erica mediteranea*, and *Azalea indica*. Those who wish to see a good view of Loch Ewe and out to the Atlantic beyond can go right on to View Point, on the very top of the Ploc ard.

About twenty years ago there was a very bad south-westerly gale which flattened out the trees on a big piece of ground at the very top. Gradually we got the fallen timber cut and cleared away, and as the surrounding trees were still standing it was proposed to plant the clearing with rhododendrons instead of replacing the forest trees.

People said they would never do on the top of the Ploc ard, so instead of spending money on them we decided to try with our own natural species of rhododendrons, of which we collected about a hundred small seedlings and dotted them about among the heather. They were mostly *arboreum*, *ambiguum*, *barbatum*, *campanulatum*, *decorum*, *niveum*, *sutchuenense*, *yunnanense*, *neriiflorum* and *campylocarpum*. (Fig. 220.) We happened to plant a great many of the latter, and now that most of them are flowering we find some beautiful crosses of *campylocarpum* × *Thomsonii*.

On leaving View Point, a path to the left (Fig. 215) brings one to the big pond (11) (Fig. 211), with its large yellow, pink and red Nymphaeas. *Arundaria nitida* is waving on the peat dam, while scrambling over the water is *Rubus tricolor*, with its luscious golden fruit. To the right, a hill-side of *Pernettyas* (Davise's seedlings) make a groundwork for *Hydrangea paniculata*, *Gunnera manicata*, *Rodgersia podophylla*, and *Osmunda regalis*. On the left, a large clump of very tall *Rosa Moyesii* can be seen.

Among *Olearia macrodentata* and edging the path grow *Funkia undulata*, *argentea variegata*, and *Iris Kaempferi*. Leaving the water garden down a steep slope towards the sea, a long path runs above the shore. High wild rocks rise on the left, and on their wet slabs the lovely little filmy fern has always had its home.

Below the rocks are many kinds of rhododendrons growing under tall white-stemmed birches. *Pyrus Eleyi* and *Sorbus Vilmoriniana* break the monotony, the latter seeding itself very freely after the birds have digested its lovely rose-coloured berries.

Retracing the path northwards, one comes to a small bay called "The Gray Bay" (Camas Glas). Some years ago we planted a lot of rooted cuttings of *Olearia semidentata* here and there in the rocks, and these are now big bushes, covered with their mauve flowers. They prove quite hardy here if put in a dry place.

Further on we come to a rhododendron walk (13). Those of most interest are the very large *sinogrande*, *Hodgsonii* (over 26 feet), 'Sir Charles Lemon,' and *fictolacteum*. Under these grow the silver-leaved tree-fern from New Zealand, also Woodwardia and *Struthiopteris germanica*.

I measured one of the *R. sinogrande* the other day and found its diameter was 21 feet and its height 22 feet. It seeds profusely on things like fallen trees and old roots. (Fig. 216.)

Going westwards, we pass a *Drimys Winteri* of twenty-five foot growth, and very large *Drimys aromatica*, till we come to the Peace Plot (15), planted after the first World War. This is nearly all rhododendrons, including one immense *Zeylanicum*; *barbatum*, 'Cornubia,' *Wightii*, *lacteum*, 'Countess of Haddington' (Fig. 228), 'Gibsonii,' *Falconeri*, *Dalhousiae*, *Griersonianum*, *yunnanense*, *eximium*, *neriiflorum*, 'Fragrantissimum,' and many others.

I should remark here on the effects of the frosts in the notorious Spring of 1947, of which we had over 25°. This killed some of the largest *Olearia semidentata*; but it was strange that *R. 'Fragrantissimum,' R. Dalhousiae* and *R. Zeylanicum* were undamaged, whereas *R. ponticum* was blackened extensively, although close by the others. Stranger still, perhaps, was the fact that the local heather, heath and brooms were cut, whereas imported shrubs came out unscathed. My father noticed the same phenomenon in his time and mentioned it in his book.

One possible explanation is that the hardest frosts of 1947, occurring in February and March, came after a particularly mild spell in January. Thus the sap of the species may have failed to respond so rapidly in the earlier month. The native shrubs and plants were then more forward and suffered worse when the frost descended.

During that same frost the voles gnawed and ring-barked some *Syringa* (lilacs) and also a *Cordyline*. I had more or less given up the trees for lost but having some deer fat left over in my larder, which was no more use for cooking, I smeared it thickly round the ringed bark of the lilac trees. Although the supply of sap appeared to have been completely cut off by the voles, the trees appear now to be recovering and give us every hope of blooming again shortly.

From the Peace Plot we pass into an enclosure which to me is perhaps the most interesting part of the gardens; it is certainly the most sheltered. There are six different *Eucalyptus* trees of immense size. Those which are found to be perfectly hardy here are *Gunnii*, *Whittinghamensis*, *coccifera*, *cordata*, *coriacea*, *corrigera* and one or two more. They all came through the 25° of frost in March 1947 without a scar. Although my father warned against it in his book *globulus* seems to do very well and indeed is the one I admire most, as its young growths are such a lovely silvery grey.

Among the tallest trees are *Aristotelia racemosa*, *Myrtus Luma*, *Plagianthus Lyalli*, *Guevina Avellana*, *Gordonia pubescens*, and several *Pittosporums*—*tenusifolium* being, I think, one of the most attractive. The huge *Guevinas* have the most wonderful foliage. There is a large bush of *Buddleia auriculata*. In February some friends came into my smoking room, sniffed the air and said, "Chanel No. 5!" I said "No, but a bowl of *Buddleia auriculata*."

Then we come to Magnolias. *Campbellii* (perhaps the king of all—37 years old and over 35 feet high) has hundreds of big buds almost ready to burst and make a wonderful rose contrast against a blue March sky. *Magnolia stellata*, said on good authority to be the largest known—quite 28 feet high and 75 feet in circumference—will soon be a sheet of white, also several others. They none of them flowered really freely until I began to give them all the wood ash I could find. *Davidia involucrata*, here a very shy flowerer, *Embothrium coccineum*, *Osmanthus Delavayi*, *Abutilon vitifolium*, and some of the newer Camellias are also here.

This enclosure we call "Bambooslem," (16) because it was one of our first plantations of bamboo. When kept under control, which is not so easy, some bamboos are very decorative. When planting, we find a deep three foot ditch round them is advisable.

In the spring under these trees and shrubs are sheets of Leucojums, Scillas, various Galanthus, Narcissus (*namus* and *cyclamineus*) and in the autumn Astilbes and *Gentiana asclepiadea*, *sino-ornata* and *Farreri*.

On each side of the path leaving this enclosure and facing south, we pass (17) big flowering Cherries, pink and yellow, and under them masses of Hydrangeas, till we come to the top lawn above the house. The Hydrangeas range in all shades from intense prussian blue until in November and December they slowly change to the most beautiful ultramarine. To maintain the depth of colour each year I find that every nine or ten years a fresh supply of peat has to be provided or they become paler and paler.

Round the top lawn are beds of heaths, azaleas, lilacs, Kniphofia, and *Dianella tasmanica* with its lovely turquoise blue berries.

There are several kinds of Watsonias, mauve, white and salmon, but there is an outstanding one that does notably well. The seed was sent to me years ago by the courtesy of the Curator of Kirstenbosch, the Botanical Garden of the Cape. Clumps of this flame-coloured *Watsonia Beatricis* (Fig. 229) are absolutely startling and catch the eye of everyone driving up to the house, although quite a hundred yards away. By them are many of the Meconopsis; *Watsonia Beatricis* seeds itself very freely here, and after it has shed its seeds the dry flower stems are very decorative in winter mixed with the dried deep blue heads of Hydrangea.

I should mention another South African flower that flourishes exceptionally well here, *Schizostylis coccinea*, 'Mrs. Hegarty' and above all 'Viscountess Byng.' The latter is far later than the others and stronger growing. It must be admitted that we had hardly any frost this last winter, but I had vases full of the latter till the end of February. When picked in tight bud it comes out in water and lasts quite six weeks. It reminds me of the once fashionable South African flower which used to be sent to this country, Chinchinchee, but instead of a dull white, the *Schizostylis* is a lovely rose pink.

I am forever developing my garden and trying out new things, so far as means will allow. In conclusion, perhaps I should look back on the mistakes we have made here—probably many more than we realize. If I were going to start a garden all over again in this district, I should avoid *Rhododendron ponticum*, and make instead hedges of *Griselinia littoralis* and *Escallonia langleyensis*. The last is very satisfactory. The

Griselinia seeds itself very freely, but it grows quickly and loves wind, and people are often glad to have the seedlings, whereas few want the thousands of *Rhododendron ponticum* which one has to grub up. *Olearia Hastii* is also very good, being very resistant to salt spray and all kinds of bad weather.

I would also recommend those who are planting good Rhododendrons to put them at least twelve feet apart and let them each grow into a single large bush. This saves a lot of labour in shifting them later on.

A few years ago a great horticulturist visited us here, and I felt extremely shy of letting him see my garden, apologizing for its unkemptness. (I knew that he had about fifty gardeners, while I had only two and a half!) However, he said "Don't alter it, it is lovely and reminds me of a wild bit in Burma or Northern China."

PLANT COLLECTING IN THE MOUNTAINS OF ANDALUCIA

Vernon H. Heywood, B.Sc.

PART I

(Based on a lecture given to the Society on October 4, 1949)

THE following notes do not claim to be a report on the expedition I had the privilege of making, together with MR. PETER H. DAVIS, to Spain in 1948 on behalf of this Society; such a lengthy and technical document could scarcely be accommodated in these pages. But it is my purpose to select for discussion some of the plants we collected, whether for their intrinsic beauty or because of the circumstances connected with their discovery, and to describe some of the lesser known areas of Spain which we visited.

Seeds were collected of over 180 different species as well as bulbs and corms of 15; these are in the main being grown at the Society's Gardens at Wisley and at the Royal Botanic Gardens of Kew and Edinburgh. We also made about 1,000 herbarium gatherings that are being divided between the herbaria of the British Museum (Natural History), Kew and Edinburgh.

The word Andalucía in the title of this paper requires some explanation: as events turned out we were practically confined to this area of Spain for the greater part of the expedition. Andalucía typifies the Spain of the imagination—"the artist's dream come to life" as the tourist posters run—but there exists in many minds a vagueness as to exactly where and what this pleasant-sounding place is.

We have to turn to geology for a precise definition, and geologically speaking there are two Andalucías—an European and an African separated by the valley of the Guadalquivir (ancient Betis). The lands to the north of this valley constitute European Andalucía which is terminated by the Sierra Morena (itself forming the southern elevated wall of the Meseta); to the south of and including the Guadalquivir, or Betic,

depression lies African Andalucía, the bulk of which is made up of the Betic Cordillera, a complex system of mountains which runs from the Cabo de la Nao to Cadiz. These mountains, which are divided by a fault (fault of the Genil) into a northern essentially calcareous and a southern predominantly crystalline series, were our hunting ground for nearly three months.

A low humidity has the effect of making the extreme Andalusian temperatures (shade maxima around 110° F.) not excessively uncomfortable, and the slight rainfall in the same period, excluding occasional thunderstorms, simplifies the process of plant-collecting.

We left England in mid-June, and after travelling overland through France by train we arrived in Madrid, parting company (one might say inevitably) with our flower presses and other baggage on the way.

During our enforced stay in Madrid, awaiting our stranded luggage, we made one excursion to the hills around the city—to royal Aranjuez by the Tagus, site of the palaces and gardens of the Spanish crown. The gardens are now poorly cultivated but tall Planes and Cypresses still shade the brown landscape. It was here that Philip II planted noble avenues of Elms (*Ulmus nigra*) introduced from England; but we did not stop to admire—our interest lay in the chalk flora of the nearby hills.

There is something unusually interesting about the flora of chalk, even in this floristically impoverished country of Britain: one always gets the impression that the species are so much more interesting and stimulating than is usual. It is certainly true that many of our rarest and most beautiful plants are calciphiles.

We took the cart track leading from the dusty town to the Mar de Antigola—an inland lake. *Eryngium campestre* and a violet-flowered Crucifer were the first plants of the expedition, and soon on the gypsum declivities masses of yellow *Helianthemum*, golden *Calendula*, white Thyme, purple *Matthiola* (*M. tristis*), and lilac *Calamintha* made us stop to fill the presses. Seed was collected of an *Iberis* which made bushes, a foot and a half tall, of velvety leaves. We are told it is *I. subvelutina*, a highly desirable plant with rose-pink or white flowers (there were none for us to see) which is confined to these dry hills near Aranjuez but appears again, according to the *Prodromus*, near Córdoba in Andalucía. *Frankenia Reuteri* grew here; it is a densely caespitose pink-flowered form—‘the most elegant of all the species’ is Willkomm’s comment. Prominent on the hillside was *Reseda suffruticosa*, a magnificent giant among Mignonettes which was for long confused with related species; an annual, it dwarfed the surrounding vegetation with its 4-foot spikes of white flowers rising from thick dissected papillose leaves. There were other Mignonettes here, probably *R. Gayana* and *R. ramosissima*, but they were quite commonplace. The pale lilac buds of *Limonium divaricatum*, clustered in long pyramidal panicles, were beginning to open in damp hollows where it was locally abundant. Other notable plants of this halophytic community included the rather rare and beautiful var. *minor* of *Hedysarum humile* with bright pink-purple Pea flowers, and *Lepidium subulatum* covered with profuse white crosses.

After a few days our flower presses reached Madrid and we took a south bound train en route for Cazorla, over the tableland of the Meseta and through the pass of Despeñaperros to Baeza. Cazorla has no railway station, or at least the Cazorla-Los Propios halt which serves it is 15 miles from the town; one has the choice of leaving the train at Los Propios and hoping there will be a lorry the same day for Cazorla, or, as we did, of staying on till Baeza which is an uncomfortable junction, connected by *tranvia* with Ubeda. From Ubeda a bus leaves for Cazorla, but having failed to get our luggage accepted on the first *tranvia* we had to wait some hours for the second: consequently we missed the bus at Ubeda. But we struck a bargain with a lorry driver and were violently conveyed to Cazorla.

The road ran through an undulating countryside planted here and there with wide groves of Olives; the violet and blue hues of the evening light cast their shadows on the trees, turning the brown landscape into a vast stepped amphitheatre. Soon the glimmering lights of Cazorla could be seen; the road climbed to meet them and the lorry stopped at the *fonda* in the square and dropped us.

In an earlier article in this JOURNAL* I described briefly a three days' trip in the Sierra de Cazorla; last year (1948) we decided to make an extensive exploration of these mountains because of their paramount horticultural and botanical interest.

Cazorla, as will be realized from what is written above, is a dead end: beyond it lie the mountains. Largely due to the lack of authoritative maps it has become customary to apply the name Sierra de Cazorla, erroneously, to all of the mountains of the State of the Sierra de Cazorla of which it in fact forms part. Details would be superfluous here but in summary form the Montes de Cazorla† consist essentially of three separate lines of peaks—the western outer Sierra de Cazorla, the central Sierra del Pozo Alcón and the eastern Sierra de la Cabrilla.

The climate is characterized by a minimal summer rainfall—36 mm. in June-August, being 5 per cent. of the annual total—and high mean and maximum temperatures varying from 8·5–12° C. and 32–38° C. respectively. We were favoured all the time with fine and warm weather although morning mists were extremely dense at high altitudes.

At the Cueva de la Magdalena in the Peña de Alcón Cazorla's celebrated troglodyte *Pinguicula vallisnerifolia* was still in flower hanging suspended from the tufa roof and walls of the cave. The biology of this Butterwort requires investigation for plump seeding capsules were rare and what seed we did collect failed to germinate although hurried by airmail to Wisley. Short of bringing the plant back alive embedded in its native rock, I see no certain way of securing it for cultivation.

The various formations around and below the Cueva were strikingly rich: on the dry rocks *Potentilla caulescens* var. *villosa* was dominant (as it is on similar exposures throughout this region) with associates including *Sarcocapnos enneaphylla*, frail and curious, with rounded dark green leaves and white flowers centred with yellow; the neat saxatile clumps

* "Through the Spanish Sierras." *R.H.S.*, 73 (8), 257–266 (1948).

† A convenient abbreviation of their full title, Montes del Estado de la Sierra de Cazorla.

of *Teucrium rotundifolium* (*T. granatense*) whose flowers open a lacteous-white, later fading pale purple; and *Globularia spinosa*.

The *Globularia*, which, according to SCHWARZ's monograph of the genus should be typical *spinosa* in this area of Spain, is very unlike the plant known in cultivation. In habit the Cazorlan plant is very robust, forming thick woody root-stocks with numerous spiny rosettes from which arise strong peduncles varying in length from 6 inches to over a foot (the latter height is most common). Only on the limestone slopes of the Cuerda de las Moras did the *Globularia* show much resemblance to the cultivated plant. There the flowering stalks were very dwarf and the rosettes small and few.

Below the Cueva on the chalky-sandy hills grew a twiggy thyme-like plant with short linear leaves and conical spikes of purple flowers; not until we returned did we identify this intriguing form as *Coris monspeliensis*, an anomalous member of the *Primulaceae*. It has been previously in cultivation but seems in most parts to have died out.

Because of the great development of forests these mountains are well provided with roads connecting the numerous Casas Forestales with the town. On June 25 we drove with our guide, Juan Garcia, to the Casa Forestal at la Nava de San Pedro (1,290 m.) which we made the centre of our operations. The Forest Station of San Pedro, the most important in the Sierra, is a strongly constructed building with a suite of rooms for visiting forest officers, and we were installed in these in great luxury.

Shortly after arriving we climbed the limestone peak known as the Cabeza del Tejo and Pico de Gargantas. The path led through forests of Pine where the ground species included *Scabiosa tomentosa*, *Aphyllanthes monspeliensis*, and *Helleborus fœtidus*, the latter being widespread in this area and almost invariably parasitized by an *Orobanche* with reddish-brown flowers. Further afield in the Serrania de Ronda and Sierra de Grazalema the Hellebore was frequently found in association with apparently the same species of *Orobanche*.

On climbing out of the *Pinetum* to the limestone slopes of the Cabeza del Tejo we found in the north-facing rocks a rich community of alpine at about 2,000 m. comprising notably *Globularia spinosa*, *Erodium cheilanthifolium*, *Linaria anticaria*, *Saxifraga Rigoii*, *Draba hispanica* and a variety of *Arenaria armerina*. The plants of *E. cheilanthifolium* collected showed considerable variation in colour. Normally the petals were pale-pink with dark lilac veins and the two upper petals blotched, but plants with almost white unblotched petals were seen. The *Arenaria* was a typical example of the curious adaptation of a species to ecological conditions at high altitudes. It resembles *A. tetraquetra* in general habit, differing mainly from this species by its larger pedunculate flowers. The leaves are much more densely imbricated than in *tetraquetra* resulting in more compact mounds with a finer surface; and the silvery-green colour of the leaves gives the whole plant a stone-like appearance.

We descended the pine-covered slopes to the Barranco de Gargantas where, opposite the Fuente de la Garganta on a rocky outcrop, *Hypericum ericoides* was in bud; it looked, as its name suggests, like a dwarf

heath. Associated with it were *Anthyllis cytisoides* and *Teucrium rotundifolium*.

Not many people seem aware of the variations in habit shown by *Hypericum ericoides*. All the plants from the Cazorlan mountains belong to the upright form* with small flowers unlike the fleshier, larger-flowered plants collected between Alcoy and Jijona (prov. Valencia), and quite distinct from the prostrate variety, as yet unnamed, from Porta-Coeli, near Valencia, and (according to the late DR. GIUSEPPI) from the cliffs by the roadside not far from Almeria.

In stony places near the Rio de Garganta a surprising find was *Dictamnus Fraxinella*; the plants were by no means typical—the flowers were a vivid lilac with darker veins on the upper petals, and the anthers green. Although the identity of our plants was checked in Madrid it is worth noting that REVERCHON collected *D. hispanicus* and LACAITA *D. albus* var. *purpureus* from the Sierra de Cazorla but the status of these forms is in need of revision.

On a later day we set off with mules for the Casa Forestal at the Nava de San Pablo. Our route took us through the Barranco de Guadalentin which is well wooded in part and supports a rich ground flora including *Paeonia Broteri*, *Lonicera splendida* and *Verbascum Hervieri*. Altogether we collected at least six distinct species of *Verbascum* in the Montes de Cazorla; of these *V. Hervieri* is the most distinct. The rosette leaves are very large and silky and the flowering stem is more or less naked and solitary, branching above into a striking pyramidal inflorescence bearing yellow flowers singly. The plants (in fruit) may reach up to 10 feet in height and a single specimen fills a flower press. A peculiar feature of *Verbascum Hervieri* is the absence of thick woolly indumentum, typical of other species, on the flowering stems which are here quite glabrous and a shining mahogany colour.

By the Rio Guadalentin a *Narcissus*, in fruit, was locally abundant; it was a tall species ranging from 2 to 4 feet with glaucous, more or less twisted leaves. The peasants called the plant 'Nardos Favoles,' and it seemed probable that it was *N. longispathus*, a new species described from the Sierra de Cazorla by PUGSLEY; but when our Cazorlan bulbs flowered in this country they did not agree with PUGSLEY's description nor did they retain their field characteristics. The spathe of the cultivated flowers was only 2–3 cm. long instead of 8–10 and the plants themselves were only 20 cm. tall. The problem awaits a solution.

We arrived in good time at the Casa Forestal of San Pablo which lies in a wide depression at the top of the Barranco de Guadalentin. It is the highest of the Cazorlan forest stations and is a good centre for excursions to the Sierra de la Cabrilla and Los Organos.

Above San Pablo we came to an alpine lake, evidently the result of a tectonic depression, for, towards the margins, jagged stumps of submerged trees were jutting out. At the far end of the lake we gradually ascended to the Fuente de la Umbria and soon approached the pinnacles of Los Organos—*locus classicus* of the rare endemic *Ptilotrichum Reverchonii*. A stream which flows over the highlands towards the base

* This is the form in general cultivation in Britain—collected by DR. P. L. GIUSEPPI in the Sierra de Cazorla.

of the peaks is known as *Aguas Negras* (Black Waters), but at the breath-taking precipice it cascades down the gorge to form the Rio Borosa in the valley below. In 1947 I climbed down to the foot of the gorge searching for *Ptilotrichum Reverchonii* with indifferent success, but this year I explored the 'organ pipes' above and found the rare Crucifer in abundance along with *Sarcocapnos crassifolia* var. *speciosa* (by far superior to *S. enneaphylla*), *Saxifraga Camposii* and *S. Rigoi*, *Erinus alpinus* var. *parviflorus* and *Viola cazorlensis*.

Naturally *Viola cazorlensis* was much in evidence throughout our excursions; not always did it grow where and how we expected. On the Pico de Cabañas, Sierra del Pozo Alcón at 2,000 m. the *Viola* leaves its customary rock fissures, which it occupies at lower levels, and grows in the loose calcareous summit screes with *Juniperus sabina* var. *humilis*, *Convolvulus nitidus*, *Erinacea Anthyllis*, *Thymelaea granatensis* and others. In this locality the *Viola* forms small poorly developed plants showing great variation in colour, size and shape of flower—carmine to pale pink, blotched with intense carmine or immaculate. Seeds of an albino form were collected from this locality in August 1948.

The departure of chasmophytes from crevices to screes and loose rocks, above certain altitudes, seems to be not unusual in the Mediterranean region.

When we returned in the afternoon to San Pablo, the masses of *Helianthemum*, which in the morning had been covered in yellow flower, had dropped all their petals to gild the ground. Nearby, the short grassy turf looked promising for bulbs and, as soon as we had unloaded the mules, we went out again to investigate. We were in luck, for in a few minutes we had found a dwarf *Narcissus* and two Tulips (mixed with a *Colchicum*!) all in fruit. The *Narcissus*, well known to the forester as being the first flower of spring, was a tiny species growing only 1-2 inches tall. We collected bulbs which flowered in Sussex on Christmas day, at Wisley a few days later and at Edinburgh in mid-February. These were identified as *Narcissus hedrianthus*.

Narcissus hedrianthus is a rare species previously known only from the type gathering; it is related to, although outwith, the *N. Bulbocodium* complex. In horticultural circles it has attracted considerable attention and a paper giving fuller information is in preparation.

The succeeding day took us through the rather uninteresting Barranco de Ginez and up a long gentle slope to the approaches of Las Empanadas, peak of the Sierra de la Cabrilla. Las Empanadas is a disappointing peak. On the lower slopes grow a few stands of *Pinus Clusiana* and above that a scrub of dwarf Juniper giving the rounded dome a bare appearance like the mountains to the east. From about 1,800 m. a formation of spiny cushion-forming xerophytes—*Erinacea Anthyllis*, *Ptilotrichum spinosum*, *Astragalus* spp.—was dominant. In the dry grey scree *Pyrethrum spathulifolium* appeared occasionally all the way up to the summit; *Convolvulus nitidus* was quite frequent in full flower along with *Erodium cheilanthifolium* and on the summit itself *Arenaria tetraquetra* var. *frigida* associated with *Ptilotrichum spinosum*. The flowers of the latter at this altitude were frequently pink or pale-purple instead of the usual white, a phenomenon also observed in the

plants of *P. spinosum* at about 2,000 m. in the Sierra Nevada below the Peñones de San Francisco where I collected seed in September from plants marked in July.

The view from Las Empanadas is impressive: to the west the crests and valleys of Cazorla, sometimes grey, sometimes dark green with Pines, stretch for miles; to the east beyond the dry slopes of the Sierra Seca (S. de Castril) lie the gaunt uninviting ranges in the north of the province of Granada, and the nucleus of the Sagra.

To the south the Sierra de la Cabrilla is prolonged into the Poyo de la Carilarga—a long range of mountains which have to be attacked from a rather dangerous goatpath which leads along below the sheer limestone walls. The substrate is mainly a loose chalky rubble and difficult underfoot. Among the few chasmophytes we had time to collect here was a tiny Campanulad with flowers in heads but unfortunately still in bud. When I returned to Cazorla in August this plant was in flower—it was *Jasione foliosa* subsp. *minuta*, a very delicate blue-violet-flowered relation of the sheep's bit scabious. Later I collected it in several other localities in these mountains. A study has been made by Spanish botanists of *Jasione foliosa* and it concluded that the Andalucían plant (from Sierra Tejeda, S. de la Nieve, S. de Yunquera, S. Maria, Macizo de Magina, etc.) represents a subspecies of the type of Cavanilles from the kingdom of Valencia (S. de Mariola, S. de Aitana). The most apparent difference of the Andalucian plant is its nearly spoon-shaped (not spatulate) leaves, although other characters separate the two forms. It is very difficult to find this species in the rock fissures as it forms such tiny rosettes and flowers in late August.

Our final journey from San Pablo took us back to Cazorla by a devious route: along and down the banks of the Rio Guadalentin which wound through the Styx-like gorge of the Cerrado Utrero we rode, later crossing the river at a well constructed bridge, guarded by an armed *vigilante*. Gradually we climbed up wooded slopes, the haunt of wild mountain goats, through a *Rosmarinetum* (mainly *Rosmarinus officinalis* and *Teucrium* spp.) to the Casa Forestal at the Fuente de la Yedra (Fountain of Ivy).

Early on the morning of July 1, with thick mist shrouding the surrounding mountains, we left La Yedra to climb the Pico de Cabañas (2,027 m., peak of the Sierra del Pozo Alcón). The high mountain path lead through forests of *Pinus Clusiana* in which we collected *Chamaepeuce hispanica*, *Catananche coerulea* and an apparently new species of *Verbascum* with ivory-white corollas faintly shaded with pale greenish-apricot. It was a biennial grey-leaved plant, simple or unbranched, and just coming into flower. We found the same species later at the Fuente del Tejo, but at neither locality was it common.

Passing on the way an ancient gnarled specimen of *Taxus baccata*—the first we had seen, and the only one we were to see—we reached the spot known as Cabañeros, not far from the Fuente Cabañela where we left our muleteers and set out to climb the Pico de Cabañas with our guide.

On the summit is a tiny shelter where a *vigilante* keeps a lonely watch. From this height the village of Pozo Alcón can be seen in the

far distance at the end of the wide valley of the Rio Guadalentin. Below the peak there is a curious limestone arch around which we collected several plants of interest: *Jasione foliosa* subsp. *minuta* in many of the crevices, and an occasional white-flowered form, a dwarf *Geranium* with white flowers veined with violet and resembling a saxatile *Erodium* in habit, and a blue-flowered *Aquilegia* 6 inches high. On the slopes below the arch we dug up a dwarf *Narcissus* which was growing through dwarf Juniper. Bulbs brought back have flowered and been identified as *N. rupicola* by the Narcissus Committee; but the plants are by no means typical and show considerable resemblances to *N. calcicola* from Portugal. It is interesting to note that Cuatrecasas records *N. jonquilla* from the Macizo de Magina, having previously called it '*N. rupicola* Duf. for. vel var. *pedunculata* in sched.—a typo floribus pedunculatis, non sessilibus, pedicellis 3–12 mm. long. perigonii tubo brevior, discrepat.' This differentiation applies equally well to our plants.

We climbed down to the opposite slopes of the Cabañas, collected our mules and rode off to the Casa Forestal at La Cañada de las Fuentes (Glade of Fountains) where the forester joined us as far as the sources of the Rio Guadalquivir. Further on we crossed the young river and took to the mountain path reaching Rasos Nuevos, which stands at 1,190 m., in the early evening.

The last stage of our journey took us to the Vertientes de Gualay and past the Cueva de Lorno where we collected the rare *Ptilotrichum longicaule* in flower—'depressed heaps . . . flopping boughs of a foot or two in length . . . frail stems carrying showers of white blossom,' is FARRER'S fanciful description—and climbed into the mountains of Navahondona, reaching San Pedro by mid-afternoon. We covered the last miles to Cazorla in a lorry, stopping at the historical Puente de Herrerías (Bridge of Forges); according to tradition, it was built by Isabel the Catholic during the pursuit of the Moors hiding in these retreats.

While our lorry was being loaded with Pine planks from the Sierra, we looked at the plants growing near the bridge and by the banks of the Guadalquivir which it spans. It was a change to find a mesophytic and hydrophytic flora here after the predominance of xerophytes in the mountains. Species pressed included *Trachelium coeruleum*, *Anagallis tenella*, *Ruscus aculeatus*, *Buxus sempervirens* and *Samolus Valerandi*.

A bumpy journey along the forest road past the outer peaks of the Sierra de Cazorla, through La Iruela, and we rattled tired and dirty into Cazorla where we found that the village's water supply had run out!

On our last excursion from Cazorla we left by the road to La Iruela and at a short distance from the town took the goat path which leads up the mountainside to the Caballo del Prado Redondo with the Peña de Alcón, the peak which dominates Cazorla, on the right and the castle of La Iruela on the left.

In the rocky crevices of the first crests of the Prado Redondo *Viola cazorlensis* was found frequently with a rich consort of *Jasione foliosa*

subsp. *minuta*, *Salvia lavandulifolia*, a rather attractive purple-flowered species, *Globularia spinosa*, still showing some colour and *Erinacea Anthyllis*. The *Viola* forms extensive colonies here and flowers several weeks earlier (it was in young fruit on July 4) than in the more elevated localities such as the Cerro Cabañas.

Further east on the Cuerda de las Moras and the summit of the Prado Redondo, the long-overlooked treasure of the *Dipsaceae*, *Pterocephalus spathulatus* is a memorable sight. Here on the hot summit screes of smooth white Jurassic chalk it appears to attain its ecological optimum, forming a distinct association with *Convolvulus nitidus*, generally accompanied by *Fumana procumbens* and an unidentified *Helianthemum*. This remarkable xerophytic community is strictly localized, but where developed forms extensive silvery-white mats. The *Pterocephalus* may cover the limestone for several yards to the exclusion of all other plants, or, as is more usual, it forms the above mentioned association with *C. nitidus*.

Along the crests of the Prado Redondo, within the dominion of the *Pterocephalus-Convolvulus* association, the most typical species were *Erodium cheilanthes*, *Helianthemum frigidulum* (?), *Arenaria tetraquetra* var. *frigida*, *A. armerina* var. *elongata*, *Teucrium capitatum*, *Globularia spinosa* and *Linaria aeruginea*, all combining to form a near perfect rock garden.

In the steep south-sloping sunbaked screes overlooking the Cañada del Tejo and Cañada de la Magdalena *P. spathulatus* shows its maximum development in size. The individual plants are as much as 10–12 inches across and the flowers show variation in colour from dark to pale pink. Few species can accompany it in such a specialized habitat—only the *Convolvulus* and *Fumana procumbens* and a white-leaved, yellow-flowered *Centaurea* were noted.

This incredibly beautiful Dipsacids is having mixed fortune in cultivation. The plants which last year prospered in ordinary soil in the rock garden at the Royal Botanic Garden, Edinburgh, have since inexplicably disappeared. But at Wisley a host of healthy young plants have been raised, and perhaps we may dare hope for some flowers next summer.

After descending to the Fuente del Tejo where we had lunch, we followed the mountain path to the Iruela-Cazorla road. On the rocks below La Iruela we collected *Campanula mollis* var. *giennensis* and *Potentilla caulescens* var. *villosa* which grew in profusion on the limestone cliffs. Then we guided our mules for the last time into the *plazeta* of Cazorla.

A second halt was made in Granada. The city stands about 2,180 feet above sea level and the mountains rise up above it to 11,400 feet. One can if desired make the ascent by taxi following the highest mountain road in Europe. We did not.

(To be concluded.)

Editor's Note—It is hoped to publish some photographs to illustrate this article with the second part in December.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1950

[Chrysanthemum 'Cotswold Gem' F.C.C. August 15, 1950, as an early-flowering disbudded variety for market. Flowers white. Described JOURNAL LXXIV, p. 422 (A.M. 1948). Raised by Mr. W. Avery, shown by Colham Green Nurseries Ltd., Hillingdon, Middlesex.

Chrysanthemum 'Deep Red Sweetheart' A.M. August 1, 1950, as an early-flowering disbudded variety for exhibition and market, a sport from 'Sweetheart'. Flowers of reflexed type, 5 inches diameter, a deep dull shade of crimson red. Shown by Colham Green Nurseries Ltd., Chapel Lane, Hillingdon, Middlesex.

Chrysanthemum 'Foremost' A.M. August 15, 1950, as an early-flowering disbudded variety for exhibition and market. Reflexed type with fine deep solid flowers, 5 inches diameter; outer petals slightly curled at tips; light reddish bronze on a base colour of golden buff, reverse gold; stems 20 inches long; foliage medium size. Raised and shown by Messrs. J. & T. Johnson, The Nurseries, Tibshelf, Derbyshire.

Chrysanthemum 'Golden Sweetheart' A.M. August 1, 1950, as an early-flowering disbudded variety for exhibition and market, a sport from 'Sweetheart'. Flowers of reflexed type, 5 inches diameter, a deep golden amber. Shown by Colham Green Nurseries Ltd., Hillingdon, Middlesex.

Chrysanthemum 'Orange Sweetheart' F.C.C. August 1, 1950, as an early-flowering disbudded variety for exhibition and market, a sport from 'Sweetheart'. Flowers of reflexed type, 5 inches diameter. rich bright orange, reverse of petals gold. Shown by Colham Green Nurseries Ltd., Chapel Lane, Hillingdon, Middlesex. (A.M. 1949.)

Chrysanthemum 'Rearlight' A.M. August 15, 1950, as an early-flowering disbudded variety for exhibition and market. Reflexed type with fine solid flowers, 5 inches diameter; deep rich chestnut crimson with gold reverse; stems 18 inches long; foliage medium size. Raised and shown by Messrs. J. & T. Johnson, The Nurseries, Tibshelf, Derbyshire.

Chrysanthemum 'Salmon Sweetheart' F.C.C. August 1, 1950, as an early-flowering disbudded variety for exhibition and market, a sport from 'Sweetheart'. Flowers of reflexed type, 5 inches diameter, soft cream pink flushed salmon with pale gold reverse. Shown by Colham Green Nurseries Ltd., Chapel Lane, Hillingdon, Middlesex. (A.M. 1946.)

Chrysanthemum 'Yellow Sands' A.M. August 15, 1950, as an early-flowering disbudded variety for exhibition and market. Reflexed type with large fine flowers. Majority of petals incurving and fairly regular; solid petals; colour a good rich yellow; stems 22 inches long; foliage medium size. Raised by Messrs. H. Shoesmith Ltd. and shown by Mr. John R. Bell, Southdown Nurseries, Horam, E. Sussex.

INVITED TRIALS, 1951—To be judged in 1951

Vegetables

Carrots (early, maincrop and late varieties)
Maincrop Peas
Cauliflowers (early varieties to mature not later than All Year Round)
Outdoor Tomatoes
Parsley

Flowers

Michaelmas Daisies (Perennial Asters)
Nemesia
Phlox Drummondii
Perennial Phlox
Iris sibirica (planted in 1949)

Preparation for Invited Trials to be judged in 1951

Vegetables

Carrots, 1 oz. of seed of each variety	} Entries to be received at Wisley not later than January 31, 1951
Peas, maincrop varieties, $\frac{1}{2}$ pint of seed of each variety	
Cauliflowers, $\frac{1}{2}$ oz. of seed of each variety	
Tomatoes, outdoor, 150 seeds of each variety	
Parsley, 1 oz. of seed of each variety	

Flowers

Nemesia $\frac{1}{16}$ oz. of seed of each variety	} Entries to be received at Wisley not later than January 31, 1951
<i>Phlox Drummondii</i> , $\frac{1}{16}$ oz. of seed of each variety	
Michaelmas Daisies	} Three plants of each variety to be received at Wisley not later than March 31, 1951.
Perennial Phlox	

Preparation for Invited Trials to be judged in 1952

To prepare for trials in the Biennial Calendar, some of the seeds and plants are required sufficiently in advance to become established by the time appointed for their consideration by the judges, namely:—

Aquilegia, $\frac{1}{16}$ oz. of each variety	} Entries to be received at Wisley not later than January 31, 1951
Myosotis, $\frac{1}{16}$ oz. of each variety	
<i>Papaver nudicaule</i> , $\frac{1}{32}$ oz. of each variety	
Polyanthus, $\frac{1}{16}$ oz. of each variety	
Schizanthus, packet of seed to produce 60 plants	} Entries to be received at Wisley not later than June 30, 1951
*Violas (seed only), $\frac{1}{16}$ oz. of each variety	
<i>Iris spuria</i> and its hybrids	} Three plants of each variety to be received at Wisley not later than September 30, 1951
<i>Papaver orientale</i>	
Pyrethrum	

* The trial of Violas includes varieties grown from seeds and from plants. The varieties grown from plants will be asked for in the early spring of 1952.

Plants and Seeds for Invited Trials

Anyone desiring to send a variety or strain to an invited trial must obtain from the Director of the Gardens an entry form which must be completed and returned by a specified date. The entrant must certify on the form either

- (a) that the variety or strain has been raised or developed by him
- or (b) that the variety or strain was, or is about to be, introduced by him to British commerce.

The entrant must also supply sufficient particulars of the history of the variety or strain to substantiate his certificate, but such particulars will not be published by the Society without the sender's consent.

BOOK NOTES

"Anatomy of the Dicotyledons." By C. R. Metcalfe and L. Chalk, with the assistance of M. M. Chattaway, C. L. Hare, F. R. Richardson and E. M. Slatter. 2 vols. pp. lxiv + 1500, with 317 figures in the text. 1950. (Clarendon Press, Oxford.) £6 6s. net.

The "Anatomy of the Dicotyledons" is the successor to Solereder's "Systematic Anatomy of the Dicotyledons," of which the English translation, by Boodle and Fritsch, appeared over 40 years ago. The new book is not a revised edition of the older one, although it is based upon much the same plan: the biggest difference is that it devotes a considerable space to the structure of the mature secondary wood or timber and, in fact, forms the first comprehensive systematic survey of wood structure.

The data are arranged on a family basis, the classification being that of Bentham and Hooker. For each family there is generally a summary of the anatomical features followed by more detailed information on the structure of different parts of the plant. There is also a section devoted to taxonomic anatomy and a valuable summary of economic uses.

Apart from the section on economic uses the information which is most likely to interest the horticulturist is that concerned with classification. Floral characters will probably always be used as the main basis for classification of flowering plants, but a knowledge of relationships will inevitably rest on more secure ground if the systematist uses as wide a range of characters as possible. Anatomical characters are likely only to supplement external morphological ones and in general they appear to be more useful in determining the affinities of larger groups, like families, although they sometimes assist with specific determinations.

The new book exceeds the length of its predecessor by some 300 pages and even this limit could be attained only by a more condensed treatment and by the omission of some of the detail found in the older book. It forms an important addition to the literature on morphological botany and as it by no means exhausts its subject it should stimulate further research along similar lines. To anyone engaging in such research it will be indispensable.

F. W. JANE

"Plant Viruses and Virus Diseases." By F. C. Bawden. 3rd ed. 1950 Pp. xv + 335. (Publ. by The Chronica Botanica Co., Waltham, Mass.; Wm. Dawson and Sons Ltd., London, W.C.2). £2 8s.

The appearance of a third edition of this well-known book will be welcomed by all plant virus workers. Actually it is, as the author points out in his preface, largely a new book rather than another edition. This extensive revision has been necessary, not so much because of any startling new discoveries, but rather because of steady increases in our knowledge of plant viruses and virus diseases. To write a book of this nature is a severe test of the writer's comprehension of his subject since the study of plant viruses embraces so many disciplines, ranging from entomology to crystallography. Mr. Bawden, however, has succeeded well in this difficult task and has covered the whole field in a lucid and readable manner.

There are seventeen chapters dealing with views on the nature of viruses, external and internal symptoms, methods of transmission, relationships between viruses and

their insect vectors, mutations and strains, the serological reactions of plant viruses—an aspect in which Mr. Bawden is himself interested—quantitative methods of assaying for viruses, purification, chemical and physical properties, crystallinity of viruses, estimation of particle sizes, types of inactivation of viruses, taxonomy, virus diseases and host-plant physiology, control measures and speculations on the origin of viruses. There is a general index and an author index. In an access of modesty the writer has omitted his own name from the author index. This is a pity because he has himself made considerable contributions to our knowledge of the subject.

The book is a handsome one and the illustrations are both excellent and appropriate. Mr. Bawden is to be congratulated on a very good and useful book.

K. M. SMITH

"A Fruit Grower's Diary." By Raymond Bush. Demy 8vo. Pp. 248. Illus. (Faber & Faber.) 12s. 6d.

This book covers Mr. Bush's diary for the years 1935-1938 inclusive and much of it originally appeared in the *Countryman*, having been started at the suggestion of Mr. Robertson Scott. It is interesting to compare methods and prices to-day with those of 1935. I have enjoyed reading these little pieces. They cover a wide range of subjects and of knowledge and will not only be of interest to the fruit grower but also to the general gardener and the naturalist.

P. M. SYNGE

"South America Called Them." By Victor W. von Hagen. 8vo. 401 pp. Illus. (R. Hale.) 21s.

This volume is an industrious compilation, worth reading particularly for the wealth of quotations selected from the letters and writings of the four great naturalists (Charles-Marice de la Condamine, Alexander von Humboldt, Charles Darwin and Richard Spruce) whose adventures and journeyings in South America constitute the main interest of the book.

Victor von Hagen's style is always lively and sometimes picturesque in a breathless, journalistic manner with a leaning towards the turgid and sensational. Thus the first chapter on Richard Spruce ends with this ineptitude, "Once the whole Amazon had been controlled by the God-intoxicated padres; now it hung midway between exploitation and apathy. A new group of men were coming to take the padres' place—the naturalist explorers. They were the precursors of big business." When Darwin had "fallen upon an ossuary of lost world mammals," he is described as being "in a state which might have been analysed as complete delirium."

Even "dipping into" Lyell's *Principles of Geology* appears to have produced remarkable reactions in Charles Darwin, for "his mind was stupefied" and "to merely think of the Andean system and the infinities of geological time needed to create it, gave him a wonderful feeling. Why, millions of ages were but the infinitesimal part of eternity. If this were true about rocks and animals, what about man? Time only could have explained the presence of the Fuegians. He sat bolt upright in the worn hammock. Time!"

There is no sign that the work of the great Catholic missionaries in the days when every expedition in the interior of the continent was a perilous trail blazing has been studied—let alone sympathetically studied.

One wishes that Mr. Victor von Hagen could have captured something of the dignity and sobriety of the literary style of the subjects of his potted biographies. But none the less we should be grateful for *South America Called Them*, for the time spent in writing and reading the book will not have been spent in vain, should it be nothing more than a lively introduction to a relatively unknown world and make the curious reader anxious to become acquainted at first hand with the great classics of travel in South America.

"Mushroom Growing To-day." By F. C. Atkins, 187 pp. (Faber & Faber.) 12s. 6d.

Although primarily intended for specialist mushroom growers, amateurs and horticulturalists in general will find much of interest in this book.

The greater part is devoted to a discussion of the theory and practice of mushroom growing on a commercial scale. Since no two lots of manure or casing soil are alike, there can be no hard and fast rules for composting, watering the beds and other processes. Inevitably, therefore, there is great diversity of opinion among growers about many of the practices of mushroom growing. Mr. Atkins draws on his own experience and that of growers and scientists at home and abroad to discuss all aspects of mushroom culture. He succeeds in presenting an excellent picture of present-day ideas and practice which will help all growers in the course of their work.

Several short chapters are devoted to mushroom growing on a small scale by amateurs and market gardeners. These chapters contain a number of useful hints on growing in cellars, outbuildings and out of doors. In conjunction with the main part of the book they should be valuable to the amateur who wishes to experiment.

There are also chapters on pests and diseases of the mushroom, and on the history and economics of mushroom growing.

The illustrations are good and include a number of drawings of insect pests. Lists of firms supplying equipment form a useful feature of the book.

P. H. WILLIAMS

“Flowering Trees and Shrubs in India.” By D. V. Cowen. 137 pp. Illus. (Thacker & Co. Ltd., Bombay; Wheldon & Wesley, London.) 35s.

This is a charming book, destined to be a source of pleasure and enlightenment to plant lovers in the plains of India. The authoress says that she is not a botanist; but if, by botanist, is meant a student of plants, I disagree with her. She has become expert in the pictorial representation of plants, and this she could not have done without studying them. Without deep and loving study she could have made neither the coloured plates representing flowering sprays nor the magic pencil sketches of the habit of the plants. In these sketches she has exceeded the generality of those who describe and figure trees, who too often give us little or no information about their general appearance. The text accompanying the figures is full of interesting information and the Colour Key will enable those using the book to identify, without difficulty, the plants dealt with. It is a pity that more attention has not been paid to the binding. The plates are unmounted and will soon separate from the strings to which they are attached.

H. GILBERT-CARTER

“Anzucht und Kultur der Bromeliaceen mit besonderer Berücksichtigung der für den Handel wichtigsten Arten” By W. Richter. 84 pp. Illus. (Eugen Ulmer, Ludwigsburg.) DM 3.80.

“Dahlien im Garten und im Haus.” By L. Jelitto and P. Pfitzer. 2nd ed. 91 pp. Illus. (Eugen Ulmer, Ludwigsburg.) DM. 4.20.

“Das Chrysanthemum, sein Formenreichtum und seine Kultur.” By M. Marggraf and G. Hartmann. 4th ed. 72 pp. Illus. (Eugen Ulmer, Ludwigsburg.) DM. 2.80.

“Die Freiland-Schmuckstauden, 1: Anzucht und Kultur.” By E. Eiselt and G. Krüssmann. 76 pp. Illus. (Eugen Ulmer, Ludwigsburg.) DM. 2.90.

The above four paper-covered little German handbooks belong to the excellent series *Grundlagen und Fortschritte im Garten und Weinbau* published by Messrs. E. Ulmer, formerly at Stuttgart, now at Ludwigsburg. Heft 76 by W. Richter is devoted to the Bromeliaceæ, a family now little cultivated in Britain but happily retaining its popularity on the Continent and becoming well known in America, for it includes many species handsome in both leaf and flower. The American Plant Life Society's publication *Plant Life*, Nos. 2 and 3 (1947), dealing exclusively with the Bromeliaceæ, has not come to the author's notice. Heft 65 by L. Jelitto and P. Pfitzer is a concise well-illustrated survey of Dahlia cultivation and includes a long list of varieties, among them many of German, Dutch and Belgian origin. Heft 17 by M. Marggraf and G. Hartmann deals equally concisely and efficiently with the Chrysanthemum. Heft 74 by E. Eiselt and G. Krüssmann is the first part of an encyclopædia on herbaceous plants, to be completed in ten parts. This describes methods of propagating herbaceous plants in general. Individual genera will be described alphabetically in the later parts. It is to be hoped that, despite present-day conditions in Germany, the authors will be able to take note of the conclusions on the nomenclature and classification of herbaceous plants resulting from research in Britain, Sweden and United States which have been made available during the last few years in N. Hylander's *Våra Prydnadsväxters Namn* (Stockholm, 1948), L. H. Bailey's *Manual of Cultivated Plants*, 2nd ed. (New York, 1949), Curtis's *Botanical Magazine* (London) and other publications. Small practical low-priced booklets like these are an admirable means of bringing such work to public notice and deserve a wide circulation among German-speaking gardeners.

W. T. STEARN

“A Monograph of Clavaria and Allied Genera.” By E. J. H. Corner. “Annals of Botany Memoirs, No. 1.” Oxford University Press (London, Geoffrey Cumberlege), 1950; pp. xv and 740, 16 coloured plates, 298 text-figures; price £5 5s.

In all of the old systems of classification of Basidiomycetous fungi, the groups were distinguished by gross morphological characters. One of the families was called

Clavariaceae, from its type genus *Clavaria*, and as may be inferred from the name the members of this family were all characterized by having an erect, cylindrical or club-shaped fruit-body, sometimes simple, sometimes branched in candelabra fashion, bearing basidia on its outer surface. Mr. Corner has studied these fungi by modern microscopic methods and has applied to them the views as to the importance of hyphal construction which he has already elaborated in papers dealing with certain Polyporaceous fungi. He has come to the conclusion that the group is polyphyletic, and therefore does not use a family name; in fact he adopts no systematic unit higher than the genus in the present work. The Clavarioid fungi of the world are placed in 27 genera, of which nine are new, with 540 species. Groups of genera which appear to be allied are put together as series.

Whether or not one agrees with Mr. Corner's premises, that hyphal construction is the primary index of affinity, and that all simple forms have arisen by degeneration from more complex branched forms, the book is indispensable to any student of Basidiomycetes. It contains a vast amount of information about these very attractive fungi, much of it from the author's own observations both in England and in Malaya. The text-figures are of the high standard that one associates with Mr. Corner's work, and serve to elucidate his theories as to structure. The coloured plates are also helpful for identification, though the figures of some species, particularly the yellow forms, have suffered in reproduction. Keys are provided for genera and species and at the end there is a glossary and a list of species and synonyms, but no general index. It is unfortunate that the price has been fixed so high that the book will be beyond the reach of most students.

E. M. WAKEFIELD

"Handbooks for the Identification of British Insects." Vol. 1, Part 6. Plecoptera. By D. E. Kimmins. 18 pp., 49 figs. 3s. 6d. net. Vol. 1, Part 9. Ephemeroptera. By D. E. Kimmins, 18 pp., 55 figs. 3s. 6d. net. Vol. 9, Part 2. Diptera, 2. Nematocera: families Tipulidae to Chironomidae. By R. L. Coe, P. Freeman and P. F. Mattingly. 216 pp., 199 figs. 20s. net. (Royal Entomological Society of London, 1950.)

The Series of Handbooks previously noted (R.H.S. JOURNAL, 1950, 75, 50), now include the above-mentioned parts written by specialists in the Orders concerned. The high standard set by the first three parts is maintained, and these textbooks will provide authoritative systematic data indispensable to all entomologists.

G. FOX WILSON

"Zur Kenntnis der Kontakt-Insektizide II." (Information on Contact Insecticides). By R. Riemschneider. 154 pp., 18 figs. (Dr. Werner Saenger, Berlin, and W. J. Johnson Inc., New York, 1950.) Price 9.90 DMark.

This is the second part of a comprehensive survey of Contact Insecticides, being a supplement of the Journal *Die Pharmazie*. The author has incorporated the researches of biochemists and entomologists throughout the world in a bibliography comprising 339 references which, together with his own investigations, provide a mass of informative matter of direct concern to all engaged in controlling crop pests. This part is so divided that the first section deals with DDT and DDD groups, the second with HCH. Information is given on their manufacture, composition and technology, chemical and physical attributes, their effect upon Arthropods and on cold- and warm-blooded animals, and analyses. Mention is made of those compounds which have been developed in Germany during recent years. The value of this work would be greatly enhanced if English translations of both parts were made available to a wider public.

G. FOX WILSON

"Guide to British Insects." By B. D. Moreton. 188 pp., 96 figs. (Macmillan & Co., London, 1950.) Price 8s. 6d. net.

This is a book of outstanding merit that deserves priority in the list of entomological textbooks used by zoological and entomological students during their period of training, and as a constant book of reference to all whose interests lie in the field of insect study. The keys that are given to the immature and mature stages of British insects are excellent though critical minds of systematists will find certain matters of controversy. It is sufficient to state, however, that the author has received guidance from Dr. F. van Emden in the matter of keys to some Orders.

There are seven chapters, including "Introduction," "List of Orders," "Structure and Life History of Insects," "Key and Description of Insect Orders," "Literature," and a brief glossary.

Some minor errors including one that names the reviewer as the author of the book whose title is given on p. 172 !

The clear and open printing, together with the size and general format of this book deserves high praise.

G. FOX WILSON

"Simple Propagation." By Noel J. Prockter. 144 pp. Illus. (W. H. & L. Collingridge, Ltd.) 6s.

This little book, so well illustrated, should be of great assistance to all keen amateur gardeners, and could even be very useful to the professional who wishes to refresh his memory on certain ways of propagation, which perhaps he has not done for many years.

It is so well written and illustrated, with each operation so clearly explained by the author, that the amateur following the instructions carefully can hardly fail to get excellent results for his labours.

The last chapter is devoted to an alphabetical list of trees, shrubs and other plants, with methods of propagation, so simply described, that one can find at a glance whether to sow seeds, propagate by cuttings, division or graft, and also the time to carry out such work, of almost everything the amateur would wish to grow in his garden.

A book really worth possessing, and the price is very reasonable.

P. DYKES

"The John Innes Glasshouses." Demy 8vo. Pp. 12. Illus. (John Innes Leaflet No. 10, Oliver & Boyd.) 1s.

The new John Innes glasshouses at Bayfordbury, near Hertford, have been built with a view to testing improvements in glasshouse design and management and incorporate many new and interesting features in their design. This leaflet has been prepared by Mr. W. J. Lawrence as a guide for visitors and for the assistance of other glasshouse growers who may be wishing to erect further houses. The lessons from the houses cannot be learnt for several years yet. It is, however, an experiment full of interest and we welcome this concise and clear leaflet about them.

"Newsham's The Horticultural Notebook." 4th edition. Revised by W. E. Shewell-Cooper. Cr. 8vo. Pp. 418. (The Technical Press.) 10s. 6d.

A handy book containing a great deal of useful and some rather unexpected information which the reviser rightly describes as a team effort. *Newsham's Horticultural Notebook* was first published in 1905 and has been known and used by two generations of horticulturists.

"Biology, an Introduction to Medical and other Studies." By P. D. F. Murray, M.A., D.Sc., Pp. viii + 600. With 381 text figures. (Macmillan and Co. Ltd.) 25s. net.

In the preface to this book the author, who is Professor of Zoology in the University of Sydney, says: "A danger in writing a text-book of biology is that of adding a book on botany to another on zoology, clapping them between the same covers, and calling the result biology." He rightly maintains that biology is a synthesis, rather than a mere addition, of these two subjects, and it is on this theme that the book has been written. The subject is covered in 53 chapters. Unicellular organisms are first dealt with, followed by more complex forms such as the fern and the frog, showing how these are adapted to live on land although they retain evidence of an aquatic ancestry in their life-histories. Flowering plants and more highly evolved animals such as the rabbit, which both in their structure and life-cycles are more definitely adapted for life on land, are also described. The wide scope of the book is shown by the fact that the physiology, nutrition and embryology of various plants and animals comprise only a selection of the other topics discussed. The text is clearly written, and another excellent feature of the book is the numerous line drawings, most of which are original and have been prepared from actual specimens.

It is almost inevitable, in a book of such wide scope, that a specialist should be able to find small points that could be improved. Thus to the reviewer, who is a plant anatomist, it appears desirable to reserve the term "wood fibres" for those that occur in the xylem. Then again, recent developmental studies have shown that the "pericycle" is not really so distinct from the phloem as is implied in this book, and the terms "dermatogen," "periblem" and "plerome" are now obsolete and should not be perpetuated in a new text-book. These are but small blemishes, however, in a book which is generally excellent, and which can be recommended to all who contemplate the serious study of biology.

C. R. METCALFE

"The Gardens of Hampton Court." By Mollie Sands. Pls. + 247 pp. (Evans Bros. Ltd.) 21s.

An immense amount of information is available about Hampton Court and many books have been written on it. Miss Sands has added another pleasant volume to the tea-table histories so popular at the present time, and no doubt it will find its public. But her title is misleading and will bring disappointment to horticulturists. The interest of the book lies in the social and personal element, and though the history of the Gardens is picked up from time to time, the connection is not close enough to justify the name. Miss Sands ranges over a wide field of political and social history, and she is a little too apt to find grist for her mill in any picturesque tale that strikes her imagination. Thus we hear again the only too well-known story of EVELYN's holly-hedges at Deptford, and are given a paragraph on the tobacco plant simply because it would *not* have been encouraged at Hampton Court by JAMES I! Those, however, who come to the subject for the first time, will find in the book a lively and suggestive introduction to many lines of interest.

The absence of an Index makes it impossible to look up any point of interest quickly, and the source of the plates is not indicated. A succession of plans showing the lay-out of the gardens at different periods would have been particularly valuable, but even if these were not provided, surely there should have been at least a ground-plan of the gardens as they are to-day. Some misprints occur, e.g. "Iconographia" for "Ichnographia" (p. 202) and "the Hon. Evelyn Cecil" throughout should, of course, be "the Hon. Mrs. Evelyn Cecil."

F. CARDEW

"The Principles and Practice of Cider-Making." By G. Warcollier, translated by Vernon L. S. Charley and Pamela M. Mumford. 367 pp. Illus. (Leonard Hill.) 35s.

This is a translation of the last (1928) edition of Professor G. Warcollier's standard work *La Cidrierie* somewhat condensed and brought up to date with additional matter, the illustrations being largely new and English. There is an interesting chapter on *eau-de-vie de cidre*, more familiar to travellers in France under the name of 'Calvados,' which ought to encourage British cider-makers to revive the distillation of Apple-Jack. Useful lists are given of all the principal varieties of cider-apples and perry-pears grown in England, France, Switzerland and the Rhineland, though not those of Spain, which rather surprisingly exports more cider than any other country. An account is included of experiments with the unblended juice of a few English dessert and dual-purpose Apples that were apparently chosen almost haphazard and might have been more profitably selected. The only one to yield cider of any quality was 'French Crab,' which seems added justification for retaining a name Dr. Hogg tried so hard to discourage. Altogether it is an invaluable book and one that fills a long-felt gap.

P. M. SHAND

"Tomato Diseases." By Robert McKay. (Colm O Lochlainn, Dublin.) Pp. 107. Illus. 21s.

This is an excellent little book on the troubles which affect Tomato crops in Ireland. After reading it one feels that Irish growers are fortunate in having a Professor of Plant Pathology who also possesses an expert knowledge of the practical side of Tomato growing. Professor McKay has certainly given them some most valuable information about Tomato diseases, ranging from recognition of the symptoms to methods required for prevention or control.

In the book there are separate sections on fungus, bacterial and virus diseases, on miscellaneous troubles such as abnormal fruits and rogue plants, on insect damage and on infestation by eelworms. The final section is devoted to general observations including advice on what can be called good cultivation and laying special emphasis on attention to hygiene and selection of healthy planting material. After each disease there are references to relevant literature concerning it, and distributed throughout the text are no fewer than 88 illustrations.

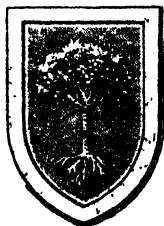
The book holds its interest throughout and will appeal to the busy grower because it is brief yet provides valuable information in a very readable form. The author has rendered good service to the Irish Tomato growing industry with this publication. The publisher is also to be congratulated—the print is pleasant to read and the illustrations are excellently done. We may be forgiven for thinking the price is rather high for a book of this size.

D. E. GREEN

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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXXV



Part 12

December 1950

THE SECRETARY'S PAGE

ANNOUNCEMENTS—DECEMBER AND JANUARY

Shows

TUESDAY, December 5	{	Fortnightly Show. Late Apple and Pear Competition.
12 NOON to 6 P.M.		
WEDNESDAY, December 6	{	Fortnightly Show.
10 A.M. to 5 P.M.		
TUESDAY, January 23, 1951	{	Fortnightly Show.
12 NOON to 6 P.M.		
WEDNESDAY, January 24, 1951	{	Fortnightly Show.
10 A.M. to 5 P.M.		

Lectures

TUESDAY, December 5 at 3 P.M. "Horticultural and Botanical Illustration" by MR. W. BLUNT.

TUESDAY, January 23, 1951, at 3 P.M. "Snowdrops and Snowflakes" by COLONEL F. C. STERN, O.B.E., M.C., F.L.S., V.M.H.

A programme of lectures is being arranged for 1951 and their subjects and dates will be given in the JOURNAL both in the preceding and in the current months.

Annual General Meeting—The Annual General Meeting to receive the Report of the Council for 1950 and a statement of accounts for that year will be held on Tuesday, February 20, 1951, at 3 P.M. in the Lecture Room of the New Hall. There will also be a show on that and the following day.

Orchid and Fruit and Vegetable Committees—There will be a meeting of the Society's Orchid Committee and Fruit and Vegetable

Committee on January 9, 1951, and Fellows and others are invited to submit novelties to those Committees on that date.

Wisley Gardens—Fellows are reminded that Wisley Gardens are closed on Sundays until March 4, 1951, though they will be open on all weekdays except Christmas Day.

Examinations 1950—At the Examination for the National Diploma in Horticulture with Honours the following three candidates were awarded the N.D.H. (Hons.):—

MISS MARY GATECLIFF

MR. FRANK SHAW.

MR. JAMES GEOFFREY CARRINGTON.

At the Final Examination for Teachers of School Gardening there were 21 candidates, of whom six obtained the certificate, as follows :—

MR. ERNEST JAMES DAVIES

MR. SAMUEL LESLIE SANDS

MR. AUBREY EDWARD ORFORD

MR. ALBERT TAYLOR TELFORD

MR. HORACE FREDERICK RALPH

MR. HARRY WALLER.

The Society's Examinations—Candidates who wish to enter for the Society's Examinations in Horticulture in 1951 are reminded that the closing dates for entry forms are as follows:—

General Examination in Horticulture, and General Examination in Horticulture for Juniors—Monday, January 15, 1951.

Examination for the National Diploma in Horticulture (Preliminary and Final) and N.D.H. (Honours)—Thursday, February 1, 1951.

Examination for Teachers of School Gardening (Preliminary and Final) Friday, April 27, 1951.

Conference on the Breeding of Garden Plants—It is planned to hold a Conference on the Breeding of Garden Plants on Tuesday and Wednesday, July 10 and 11, 1951. This Conference will be held in conjunction with the Society's Fortnightly Show. Papers will be given by leading experts, one on the afternoon of Tuesday, July 10, and two on the morning of Wednesday, July 11. There will be a discussion on Wednesday afternoon in which eminent plant breeders will participate. On Thursday, July 12, one paper will be given in the morning and one in the afternoon. On Friday, July 13, a day excursion has been arranged to the JOHN INNES HORTICULTURAL INSTITUTION at Bayfordbury, possibly extended to prominent establishments in the district. On Saturday, July 14, a day excursion has been arranged to the Society's Gardens at Wisley and to MESSRS. SUTTON'S Trial Grounds at Reading and Slough. Programmes may be obtained later from the Secretary.

Publications—A leaflet giving a list of new publications issued by the Society was included in the November JOURNAL. It is requested that Fellows complete the Order Form enclosed for such publications as they may require in good time before Christmas.

WISLEY IN DECEMBER

IN this season, visitors' attention will naturally be directed almost entirely to the greenhouses and they are sure to find much that will interest them there.

The Stove House is mainly devoted to Orchids, but in the first section there is a general collection of stove plants, including a group of Poinsettias arranged round a small central tank. The upper whorls of leaves constitute the showy part of this plant and vary from pink, flame and scarlet to white. They require as much light as possible and an even temperature of not below 60° F. *Plumbago rosea* makes another very good pot plant for this season. The phlox-like flowers are borne in numerous terminal spikes and are of an attractive shade of salmon-pink. Contrasting in colour with these are plants of *Coleus thyrsoideus*, one of the best of the ornamental-flowered group, carrying large Gentian-blue spikes. There is a fine specimen of that somewhat rare plant *Agapetes macrantha*. The flowers are urceolate, very thick and waxy, pinkish-white strongly veined with crimson and hang in large umbels from thin twining stems, but it is not the quantity of flower but the strange veining which makes the plant such an arresting spectacle. Trained up the roof-supports is *Clerodendron Thompsonae magnificum* carrying hanging flowers with creamy-white calyx, crimson petals and long exserted stigma. Turning to the Orchids, the Cypripediums are flowering well, as are the first Cattleyas and *Angraecum distichum*, whose hanging white-flowered racemes smell strongly of vanilla. The genus *Calanthe* is one of the most useful and popular groups of Orchids as it supplies an uninterrupted succession of flowers during the winter months. One of the most valuable is the carmine-flowered *Calanthe Veitchii*, a hybrid between *C. rosea* and *C. vestita*. The first hybrid to be obtained in the Vestitae section, it was raised by DOWNING at MESSRS. VEITCH'S nurseries in Exeter in 1856. There is also the similar, but white-flowered, *Calanthe Harrisii* to be seen. There are few Orchid collections in which *Trichosma suavis* is not represented, and this is no exception. It is a monotypic genus separated from *Coeloglyne* on account of having stems which are not thickened into pseudo-bulbs, and eight pollinia instead of four as in *Coeloglyne*. It was discovered by GIBSON in 1836 in the Chirra district of the Khasia hills where it grows on trees. In cultivation it requires cool treatment to produce the racemes of small fragrant white flowers with their distinct maroon-streaked centres.

In the Temperate House the blood-red clustered flowers of *Malva umbellata*, the six-inch long light orange racemes of *Buddleia madagascariensis*, one of the most widely known plants on the French Riviera, and near by, the similarly coloured *Cestrum aurantiacum*, form bright patches of colour. Species of *Epacris* were once among the most valued of winter flowering plants, but are seldom seen to-day. *E. impressa* is one of the best and incidentally one of the hardiest, producing three to four foot-long spikes of pink heather-like flowers over a long period. A number of plants are decorating this greenhouse intermingled with *Erica canaliculata*, the flowers of which will last in beauty for about two months. It is a superb plant when grown out of doors, as it can be in the west of England, where it reaches a height of over ten feet with

enormous spires of white translucent flowers and purple anthers giving the flowers a shadowy appearance. The pure white blooms of *Erica Veitchii*, sweetly hawthorn-scented, are freely produced. It is a chance hybrid between *E. arborea* and *E. codonodes* but without the latter's pink tones in the bud. Those who appreciate pretty detail among plants will be interested in *Fuchsia procumbens*, a prostrate, trailing plant set with scarlet fruits like small Cherries. *Camellia japonica* 'Magnoliaeflora' is covered with pale pink blooms, and *C. Sasanqua fragrans*, with white, cup-shaped ones; *C. japonica* 'Adolphe Audusson' has double carmine flowers, and *C. j.* 'White Swan' combines perfect form with snowy whiteness. Two Rhododendrons are also flowering extremely well, *R.* 'White Wings' and *R. mucronatum*. *Eupatorium micranthum* is not a very distinguished plant, but nevertheless forms a well-shaped shrub with neat evergreen leaves and foamy clusters of white flowers. From the coastal sand dunes of New South Wales and Queensland comes a good climber, *Hibbertia volubilis*, with large butter-yellow flowers and bronzy young growths. A good specimen of a scarlet-flowered Bottle-Brush, *Callistemon speciosus*, is flowering well. It makes a superb pot plant, being decorative even when not in flower on account of its neat habit and blue-grey leaves. It is often sold under the erroneous name of *Metrosideros floribunda*.

In this house there is only a small collection of succulent plants, but one which contains representatives of a large number of genera. Most of the Alocs are too large to be grown in the average collection, but there are one or two which are worth trying. *Aloe aristata* flowers freely in cultivation and appears to be almost hardy in sheltered positions. *A. brevifolia* is an attractive species with thick glaucous leaves armed with stout teeth. *A. arborescens* makes a tall stem but takes some years before becoming very large. The Bryophyllums come chiefly from Madagascar. *B. Daigremontianum* is a handsome species with flat thick leaves marbled with purple on the undersides, notched along the edge, and at each notch a small plantlet is produced. The flowers are pinkish-buff, borne in large terminal heads. The Faucarias were at one time included under the heading of Mesembryanthemum, a group which has now been divided into over a hundred different genera. There are several species represented here, the most popular being *F. tigrina*, known as Wolf's Chaps on account of the strongly developed teeth on the margins of the leaves. This plant has particularly fine yellow flowers. In addition, numbered among those in the collection are Haworthias, Gasterias, Glottiphyllums and species of Echeveria.

In the Half Hardy House are a few plants which make a brave show throughout the winter months. Notable among them is *Lithospermum rosmarinifolium* with deep gentian-blue flowers, *Cuphea micropetala* and the dwarf Mexican *Fuchsia microphylla* with small, deep pink flowers. *Fascicularia bicolor*, a plant infrequently seen in cultivation, occasionally produces dense heads of greeny-blue flowers in the midst of a rosette of rigid linear spiny leaves, those surrounding the flowers being stained brilliant scarlet in the lower third. Like the above, *Puya alpestris* is a Chilean plant and of similar form. The grey-green leaves are strongly recurved and set with hooked spines.

MASTERS MEMORIAL LECTURES, 1950

THE ORIGIN AND IMPROVEMENT OF CULTIVATED PLANTS

M. B. Crane, F.R.S., A.L.S., V.M.H.

JOHN INNES HORTICULTURAL INSTITUTION, BAYFORDBURY,
HERTFORD, HERTS.

PART II

(DR. H. V. TAYLOR, C.B.E., V.M.H., *in the chair*)

The Induction of Polyploidy

THE crossing of distantly related plants has been done ever since the discovery of sex in plants, in order to bring desirable characters together. This is not difficult, but, like the Cherry Plum \times Sloe crosses, described in my last lecture, the normal hybrids thus created are usually sterile and hence often of little value. In contrast the double hybrids with twice as many chromosomes are highly fertile and productive. In brief, the sterility in the normal hybrids is due to the inability of the chromosomes to pair; in the double hybrid the doubling of the chromosomes provides identical sets which readily pair and in this way the plant functions as a diploid and fertility is restored.

In the past we have had to await the rather rare "accident" of spontaneous chromosome doubling for the restoration of fertility and the production of desirable new forms. It is at this point, by providing the plant breeder with new tools with which he can induce "accidents" of this kind at will, that comparatively recent discoveries are lending a hand. One such tool, amongst others, is the discovery that the drug colchicine, when suitably applied to plants, will induce chromosome doubling. For producing polyploid plants by the use of such drugs, treatment of dormant or relatively inactive tissue is least effective. It is probably due to this that, so far, success has been mainly obtained by treating plants with relatively soft tissues which produce new growths freely and rapidly, e.g. annual or herbaceous plants such as *Antirrhinum*, *Marigold*, *Tomato*, *Oenothera*, *Tradescantia*, etc. The aim of the treatment is to induce chromosome duplication in the cells of the growing point, i.e. those cells which will develop into a new shoot, and the best results are obtained by early treatment such as on germinating seeds or young seedlings or young shoots. The usual method is to soak germinating seeds or young shoots in a weak solution of colchicine or to apply drops to the growing point of a seedling or young branch, and since the drug is most effective when there is active cell division it is important to encourage rapid growth. Sometimes this can be achieved in plants which are normally slow-growing by removing the seed coat and growing them at higher temperatures. For example, with Apples and Pears, my colleague, DR. P. T. THOMAS, obtained the best result by dissecting out the embryo of seeds freshly removed from the fruit before treatment. Where treatment has been effective, growth is temporarily

stopped and the root tips become swollen or bulbous (see Fig. 236). With such material the aim should be to select the most retarded plants and nurse them back to normality by growing them in a moderately high temperature and under moderately humid conditions. The seedlings shown in Fig. 231 were treated in a 0.05 per cent. solution of colchicine and the photograph taken twenty-four hours after treatment. Fig. 234 shows a normal diploid cell of an Apple with thirty-four chromosomes and a tetraploid cell with sixty-eight, the result of colchicine treatment, and Fig. 232 is the Radish variety 'Scarlet Globe'; on the left normal diploids, and on the right induced tetraploids. Although colchicine can be used on all kinds of plants it is probable that its most valuable use lies in the restoration of fertility in hybrids.

My colleague, DR. D. LEWIS, 1943, has used a different and novel method for producing polyploids by the use of heat shocks and by what he calls the incompatibility sieve. The heat shock, 45° C. for one to two hours, is given to branches of fruit trees at the early stages of germ-cell formation by means of a thermostatically controlled heating cylinder. This gives rise to a proportion of unreduced diploid pollen grains. The resulting mixture of haploid and diploid pollen is then applied to incompatible styles, in which only the diploid pollen functions, thus giving triploid seedlings. In this way triploid types of 'Beauty of Bath,' 'Northern Spy' and 'Cox's Orange' Apples, and 'Fertility' and 'Conference' Pears have been produced.

Another simple method for inducing polyploids can be used in some plants. It is the decapitation method, where young and rapidly growing plants are cut through at an internode. A callus is then encouraged to form on the cut surface, and from this buds and shoots differentiate as shown in the Tomato plants in Fig. 233. About seven per cent. of the shoots formed in this way are tetraploids; such shoots can be distinguished by their sturdier growth and are readily propagated vegetatively.

X-rays have been, and are continuing to be extensively and successfully used, for chromosome rearrangement and the induction of mutations.

The Action of Genes

In my previous lecture I referred to some of the more obvious ways in which genes take part in the determination and inheritance of the characters of plants, such as the colour of flowers, habit of growth and so on. But they control numerous characters and processes in plants which are not so readily apparent. Thus sexual incompatibility which is common in fruit trees and a phenomenon widespread throughout the plant kingdom is determined by genes. In the wrong, *incompatible*, combination they prevent the pollen-tubes from growing down the styles and effecting fertilization, and hence no seed or fruit is formed. In the right, *compatible*, combination, however, the pollen-tubes travel the length of the styles, fertilization occurs and seed and fruit is freely formed. In the Raspberry genes determine whether the flowers are hermaphrodite or whether one or the other of the sexes are absent, thereby giving plants which are entirely male, or plants which are female.

The action and cumulative effects of genes are well illustrated by investigations carried out in America by MANGELSDORF and FRAPS (1931) relating to the number of genes for pigmentation in the cells of the endosperm and the amount of vitamin A in the seed of Maize. As in most angiosperms, the endosperm of Maize results from a sexual fusion in which two maternal nuclei combine with one male nucleus. Hence in respect of yellow pigmentation, the cells of the endosperm may have none, one, two or three genes for yellow pigment with the corresponding genetic constitution yyy , yyY , yYY , YYY . The four classes are approximately white, pale yellow, dilute yellow and deep yellow respectively. By making the appropriate pollinations these four classes of seeds were obtained, and their vitamin assay determined in two successive years. The results obtained showed a high degree of association between the number of Y genes present in the endosperm and the number of units of vitamin A per gram of seeds. The average results for the two years were as follows :—

No. of genes for yellow	Genic composition of endosperm	Units of Vitamin A per gram		
		1928	1929	Average
0	yyy	0.05	0.05	0.05
1	yyY	2.50	2.00	2.25
2	yYY	5.00	5.00	5.00
3	YYY	7.00	8.00	7.50

These results show that a white-seeded variety of Maize, the endosperm of which ordinarily has little or no vitamin A, is capable of forming this substance in its seeds if the gene for yellow pigmentation is introduced, the only difference in the seeds being the microscopic pollen nuclei which entered to produce the endosperm. They also show that there is a direct quantitative relationship between the number of genes for yellow in the cells of the endosperm and the amount of vitamin A in the seeds, each gene for yellow inducing approximately 2.5 units per gram of seed.

The units of inheritance are almost entirely contained within the nucleus of the plant-cell, and are carried over from one generation to another in the nuclei of the germ-cells and in normal crosses it does not matter which is the female; the reciprocal crosses are the same. Usually the cytoplasm and its inclusions, which comprise the remainder of the cell contents, play no conspicuous part in inheritance. Exceptions to this are known, however, and in certain cases the cytoplasm itself may transmit a definite character or modify the action of the genes. Thus, there is a yellow-leaved form of *Primula sinensis* which, when pollinated by green-leaf forms, gives only yellow-leaved progeny in the first and all subsequent generations. When the reciprocal cross is made the progeny are all green.

In some cases a gene, or group of genes, behave differently according to the way they are associated with the cytoplasm from one plant to

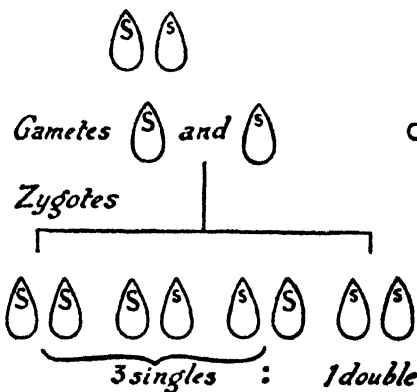
another. For example, in a cross between procumbent and tall forms of flax, *Linum usitatissimum*, a gene, or genes, associated with the cytoplasm from the tall parent give hermaphrodite plants, having both male and female organs on the same flower, whereas the same gene, or genes, associated with cytoplasm from the procumbent parent gives female forms. Similar examples of extra-nuclear inheritance are known. They are most common in reciprocal hybrids between species.

In many species of plants double flowers are a feature of horticultural varieties. Doubleness is rarely simply inherited; at one time the evidence was that in *Tropaeolum* the double flower character was a simple recessive to single flowers. But more detailed investigations have shown that more than one gene is involved and that different degrees of doubleness occur. In addition there is a super gene for double flowers which is dominant.

The inheritance of double flowers in the the Ten Week Stock, *Matthiola incana*, is complex and has for long intrigued both the seed grower and the horticulturist. In this race of Stocks there are singles which are homozygous SS and hence give only single flower offspring. Singles which are heterozygous Ss and give 3 singles to 1 double, and then there is the so-called ever-sporting strain in which the singles give approximately 1 single to 1 double and this is the strain which is mostly grown in our gardens (see Text Fig. 1). One frequently hears of Stocks giving a much higher proportion of doubles than 50 per cent.; this I think came about in two ways (1) seeds which give rise to singles appear to be less viable than those which give doubles and in this way old seed may give a higher proportion of doubles than the expected equality. (2) In some Stocks in the seedling stage doubles are larger and more robust than singles and hence there may be selection, conscious or unconscious, for double flowering plants. By such selection over 90 per cent. of plants with the desired double flowers have been obtained.

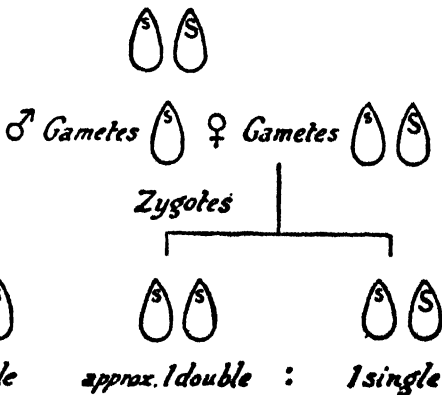
Pure breeding Strain,

Heterozygous single.



Eversporting Strain.

Heterozygous single.



Text Fig. 1.

In the Carnation doubleness is a character of practically all commercial varieties. The single Carnation usually has five petals while at the other extreme the full doubles have a petal number of over three hundred. Horticulturally these very full doubles are not attractive. They do, however, produce good pollen. Hybridization of these two types produces the commercial standard double, i.e. the intermediate semi-double with forty to sixty petals. Thus these commercial Carnations are unfixed hybrids of a non-dominant constitution.

In the Dahlia, Chrysanthemum and many other flowers the inheritance of doubleness is quantitative and complex and between the single and the full double flower all degrees of doubleness occur.

Although exceptions occur, it is common to find a more complex and wider range of variation in polyploid plants, especially in high polyploids, than in diploids; compare, for example, the variation within the diploid *Prunus cerasifera* and the tetraploid *Prunus spinosa* with that in the hexaploid garden Plum *Prunus domestica*, also the variation within the tetraploid species of *Dahlia* with that of the octoploid garden *Dahlia variabilis*. Again, variation, is commonly discontinuous in diploid plants, but in polyploids it is more often of a continuous nature, owing to the presence of a greater number of gene differences. Where two or more genes govern the expression of the same characters, as is common in polyploids, their effect is often cumulative, and consequently a given character may intergrade from one extreme to the other. Although new forms which arise from interspecific hybridization and chromosome duplication often reproduce themselves as new and constant types, great variation may subsequently occur as a result of the recombination and interaction of the many different genes brought together. In this connexion those who induce polyploids of this kind should remember that the new induction may be only the beginning and not the end of possibilities.

The kinds of complications to which I have referred above, I feel, have frequently led practical breeders of horticultural plants to become suspicious of genetics and even to doubt the truth of the Mendelian theory of heredity. The simple ratios and simple laws of inheritance they have been led to expect, as a result of the early investigations with diploid plants, such as the Sweet Pea and Primulas, did not seem to apply to such plants as Dahlia, Chrysanthemum, Carnation, Plum and Apple. The phenomenon of dominant and recessive characters was often obscure, and simple segregation was not always evident. However, as I have pointed out, in the case of polyploids where a number of cumulative and differential genes may govern the same character, the expression of dominance is essentially more variable. In addition those who breed the plants I have just mentioned, should remember that they are invariably using varieties which are maintained vegetatively and hence may be complex and extremely heterozygous.

Hybrid Vigour

To review in detail the different ways by which the high yield and other outstanding qualities of our leading horticultural varieties have been obtained would take a long time, but breeding and selection have

played major parts. In most cases, of course, this has only been achieved after many years' work, but in recent times a short cut has been taken to crop improvement.

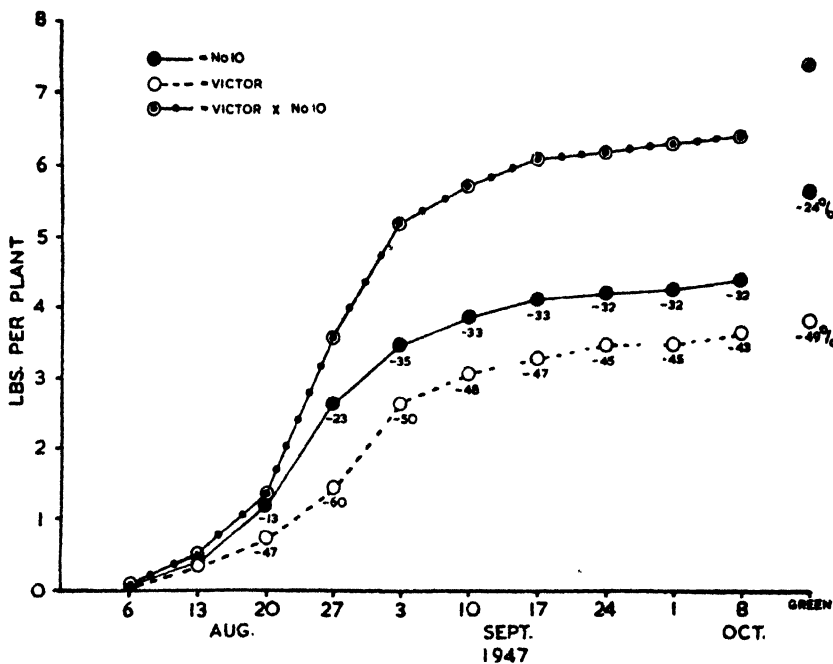
When two inbred strains or varieties of plants are crossed together it commonly happens that the first hybrid generation is more vigorous than either of its parents. Often this hybrid vigour is accompanied by a higher yield and other advantages, and in plants so diverse as Maize and forest trees this hybrid vigour has been used with profit and success. In Maize it has been utilized in America on a gigantic scale, and a number of hybrid strains have been introduced for general cultivation both from experimental stations and from commercial seed companies. In pre-war, up to 1939, the average yield of Maize per acre in U.S.A. was 25 bushels, whereas by using hybrid vigour the average yield in 1948 was 42.7 bushels, an increase of over 70.0 per cent. (HAINSWORTH, 1949); and during the period 1946-48 the U.S.A. produced more than 3,000,000,000 bushels of Maize annually. In addition to taking a major part in this enormous increase in yield, hybrid generations have been found which are more uniform, and more able to withstand drought, wind, disease and other unfavourable conditions than the best standard varieties. Though the old kinds have to be retained, this type of Maize, raised anew each year from controlled crossing, has therefore almost displaced the older standard kinds from cultivation.

In breeding experiments with *Sorghum*, KARPER and QUINBY (1937) obtained different degrees of hybrid vigour, and they state: "It follows that the different degrees of vigour obtained represent differences in the number of dominant genes favourable to growth, and that the effect of these genes, though small individually, is cumulative. More specifically, it is apparent that certain genes affect the ability of the plants to tiller, certain others affect the number of nodes, others size of leaf etc." In the maximum hybrid vigour lines in *Sorghum*, an increase in the yield of grain over twice as much as that of the higher yielding parent was obtained.

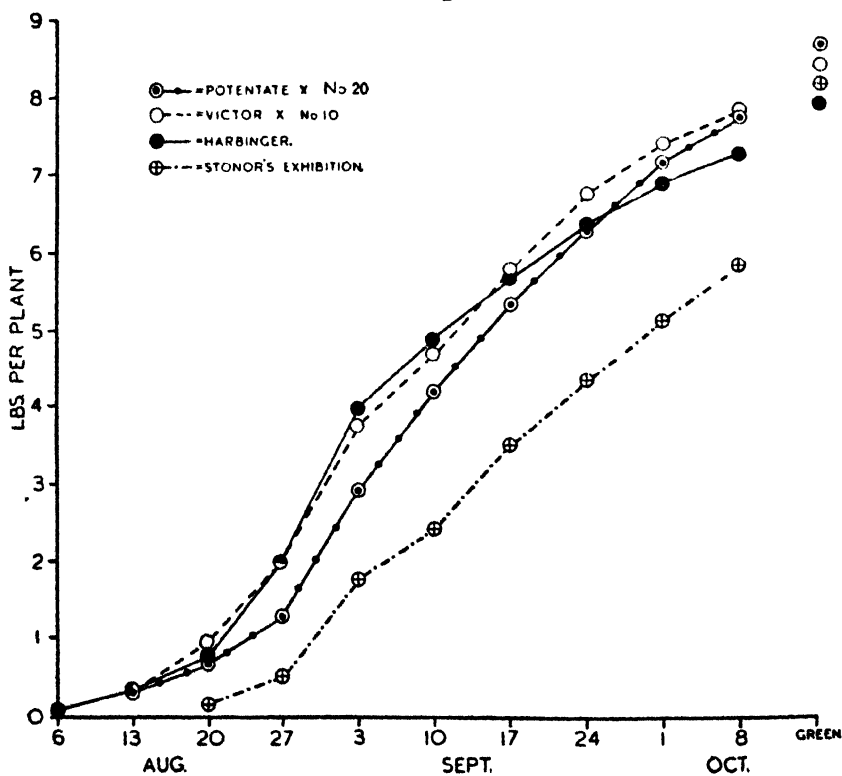
In horticulture hybrid vigour is only just beginning to receive direct attention, but in certain crops it has been unconsciously utilized for centuries. Many of our asexually propagated crop plants have been selected for vigour of growth, high yield, etc., which are to a large extent the result of hybrid vigour. Among such plants are Potatoes, Apples, Pears, Strawberries and Raspberries. Hybrid vigour in these is evident from the fact that they invariably lose much of their vigour when inbred, but the vigour is, of course, maintained in varieties of these crops by the horticultural practice of vegetative propagation; that is, of course, as long as they are free from the inroads of virus and other troubles.

In some American seed catalogues hybrid lines of Tomatoes and Cucumbers are described. At Bayfordbury we are investigating the possible utilization of hybrid vigour in Tomatoes and in some hybrid generations a considerable increase in yield of fruit has been obtained beyond that of either parent (see Fig. 235 and Text Figs. 2 and 3), but the refinements which are esteemed in this country, such as a medium size and uniform shape of fruit, require further investigation.

In these experiments the Tomatoes have been grown out-of-doors



Text Fig. 2



Text Fig. 3

and stopped at the fifth inflorescence; picking of ripe fruit was begun the first week in August and finished the second week in October. As shown in Text Fig. 2, by that time the hybrid line had given two pounds of ripe fruit per plant more than its highest yielding parent. In Text Fig. 3 the same hybrid line is shown with the varieties 'Harbinger' and 'Stonor's Exhibition.' In experiments we have carried out with established varieties 'Harbinger' has been outstanding for early ripening and 'Exhibition,' though late ripening, has been outstanding for yield, and in these experiments we now use them as a measure of earliness and yield respectively.

Plant Improvement

During the past three or four decades much progress has been made in the breeding of agricultural crops for specific purposes. A notable achievement was the breeding of Bread Wheats for resistance to rust disease. Considerable breeding has been also carried out with horticultural plants and crops in an attempt to combine such characters as early maturity, resistance to disease, etc., with high quality, high yield and other desirable characters.

Progress has been made in breeding Asters for wilt disease and Antirrhinums for resistance to rust. In the Potato immunity to wart disease, *Synchytrium endobioticum*, is a feature of all recently introduced varieties, and some are resistant to blight, *Phytophthora infestans*. Inheritance of resistance to blight is complicated owing to the different strains of blight which exist. Different races, or strains, likewise appear to occur in the Antirrhinum rust, Tomato leaf-mould and many other parasitic fungi.

The work of BLACK (1947) with Potato blight is particularly informative and of great practical value. The common strain of blight he calls A, and two more recent strains B and C. Although B and C are more virulent than A, they differ qualitatively from each other. A fourth strain, D, appears to be slightly less virulent than C and it differs from it quantitatively. Studies on the inheritance of resistance show that, with the A, B and C strains, blight resistance behaves as a dominant, and appears to be controlled by four major genes, Ra, Rh, Rc and Rbc. These confer resistance from strains A, B and C and all three respectively. It is also concluded that minor genes act as modifiers in the resistant varieties and determine the degree of susceptibility in the susceptible varieties. Apparently resistance to blight has been largely obtained from breeding the blight resistant species *Solanum demissum* with *S. tuberosum*.

At the John Innes Institution we are carrying out breeding experiments with Tomatoes for resistance to leaf-mould, *Cladosporium fulvum* (see Fig. 236), and have found that some of the older resistant varieties are dominant for resistance, the F₁ families raised from crossing them with susceptible varieties are all resistant. In others the resistance is recessive the F₁ families raised from crossing them with susceptible varieties being all susceptible. In our early work the resistants we raised were characterised by rather small fruit, a yield lower than that of the best yielding susceptible varieties, and late maturity. The first two of these

defects have been overcome and the work is being continued to attempt to obtain early ripening of the fruits combined with resistance.

In the Peach, *Prunus persica*, it has long been known that varieties without glands on their leaves are highly susceptible to mildew, whilst varieties with glands are extremely resistant.

In *Prunus persica* there are of course varieties with hairy fruits, Peaches, and varieties with smooth fruits, Nectarines. The hairy character of the fruits is dominant and the smooth character recessive. In both, varieties occur with glands on the petioles of their leaves, some with small globose glands and others with large reniform glands. The eglandular and the reniform glands are homozygous and breed true. Crossed together they give globose glands, and if these are selfed they give a ratio of 1 : eglandular, 2 : globose glands, 1 : reniform glands. Both the globose and reniform gland individuals are highly resistant to mildew. Fig. 237 shows on the right-hand side a family raised from selfing the Peach 'Royal George,' a variety without glands, and on the left a selfed family raised from the Nectarine 'Lord Napier,' a variety with reniform glands. As shown in the photograph the 'Royal George' family were all badly affected with mildew; in this experiment no spraying to control the disease was carried out and eventually they all died owing to the severity of the attack.

In contrast, the majority of the 'Lord Napier' family were entirely free from mildew, although many branches of two families were interlaced. There were twenty-eight individuals in this family and only on two was mildew observed, and on these the attack was very slight and confined to a few young terminal leaves towards the end of the growing season. In the large Peach growing areas of the world varieties with glandular leaves have almost entirely displaced eglandular varieties.

For many years, in conjunction with the East Malling Research Station, I have been interested in the resistance of the Apple to the woolly aphis, *Eriosoma lanigerum*, possessed by the variety 'Northern Spy.' In families raised from crossing this variety with a number of the susceptible clonal root-stocks, both highly resistant and susceptible seedlings occurred (see Fig. 239). The hereditary behaviour of resistance to the woolly aphis is complex and in several respects exceptional. Seedlings in the same family grade from high susceptibility to complete resistance. Some crosses between susceptible and resistant gave all susceptible offspring. At the other extreme, the highest proportion of resistant seedlings, 47 per cent., was obtained by crossing susceptible with resistant, whereas 33 per cent. was the highest proportion of resistants obtained from crossing resistant with resistant. These results show that the susceptible forms are genetically of different kinds; some possess genes concerned with resistance, others do not. The resistants are also of different kinds; some have a higher value in respect of the hereditary transmission of resistance than others.

At the John Innes Institution we are carrying out breeding experiments with dwarf and bush varieties of Tomatoes. Fig. 238 shows the early ripening variety 'Puck' which combines the sturdy growth of the variety 'First-in-the-Field' with the bush habit of the variety 'Victor.'

More recently we have obtained a more compact and a more early ripening form of 'Puck.'

In this lecture I have given some account of the making of polyploid plants, the action of genes, and examples of plant breeding and plant improvement. To attempt a complete survey of the achievements of plant breeding would be beyond the scope of this lecture; much improvement has been made in many of our garden decorative plants and flowers and in this improvement breeders have taken advantage of new mutations, new polyploids and also of newly introduced species. Apart from outstanding achievements it is worthy of note that in our economic crops even a slight improvement, whether by reducing the high cost of spraying for the control of disease, or by increasing quality or yield, may amount to a huge sum in the economy of a nation.

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THE "ORTO BOTANICO," PADUA

Hugh Farmar

PADUA has many claims to fame. The University, founded in 1222, was renowned throughout Europe from the Middle Ages onwards, and still keeps its pre-eminence as the mother of Italian medicine. There are the Giotto frescoes, those of Mantegna sadly bomb-scarred, and DONATELLO'S marvellous equestrian statue, the Gattamelata, in front of the many-domed Cathedral. But very few visitors, when they have seen these wonders, explored the arcaded streets and made their wish at St. Anthony's shrine, discover that there is also a treasure of equal, if not greater, interest tucked away in a side-street behind the Cathedral square.

The Orto Botanico lies at the end of a cul-de-sac and, in order to reach it, one crosses a little sixteenth-century bridge which spans what was once a brook and is now a dry ditch except in the winter rains. Yet, even when one has reached the entrance, the Garden remains sequestered behind its high surrounding wall.

At first sight the plan of the Garden appears to be simple. The circular wall is pierced at the four corners of the compass by gates with tall piers surmounted by handsome urns holding wrought-iron flowers. There are the Crown Imperial (so favourite a flower in the seventeenth and early eighteenth centuries), Madonna Lily, Pineapple and Yucca. From these gates four walks converge on a central fountain and, within the segments thus formed, are four inner square gardens surrounded by somewhat ugly iron railings. Each of these gardens in turn has a central octagonal basin and fountain; and the first impression is that the whole Garden was designed to single geometric plan, an illusion heightened by the presence of a number of trees which tend to obscure the subtlety of the conception. It is only on a closer view that the skill of ANDREA MORONI, a contemporary of PALLADIO and a famous architect in his day, becomes apparent.

None of the four gardens is in fact similar. Each is an essay in different geometrical patterns, though the practice of bordering the flower beds with deep narrow stones sunk to within a few inches of the ground is adhered to throughout. Except in the case of a modern pond, similarly divided so as to accommodate aquatics, the original sixteenth-century stones appear to be still in place.

The confined space of these four gardens has been most ingeniously used to obtain, not only the best effect architecturally, but also to give growing room for the largest number of plants. In one case the design is one of concentric circles of the tiny stone-bordered beds, in another one of a complicated series of triangles. Or again rectangular and elliptical beds are combined. Particular skill has been shown in filling up the corners of the square gardens and in graduating in size the concentric beds from those, comparatively large at the outside, to very small ones round the central fountain. (Fig. 243.)

Padua passed under the suzerainty of Venice in 1407 and, while she lost her importance as an independent state, she became the university city of the Venetians and benefited from the republic's greatest period of prosperity. The two cities were joined, as now, by the river Brenta and

a short passage across the lagoons. And, from the sixteenth century onwards, when the Venetian grandees were first permitted to own property on the mainland, the increasing traffic of barges and gondolas passed by a long series of splendid country houses from PALLADIO's classic Villa Malcontenta, with its huge portico reflected in the still green waters, to comparatively late baroque palaces where the patricians took their ease in the hot weather. It was said that none of the water diligences which plied between Venice and Padua was without a priest, a student and a courtesan. But, as we shall see, there can be no doubt that the barges also carried thousands of exotic plants and their seeds brought home in the Venetian argosies. While the commerce of Venice flourished, the Paduan Garden remained the prime recipient and distributor of an increasing treasure of plants new to Europe.

As in a number of other cases, the Garden at Padua began as a physic garden. The Venetian Senate had inaugurated a Chair of "Lectura Simplicium" in 1533, the first of its kind in universities, and appointed FRANCESCO BONAFEDE as its first occupant. Twenty years later a new branch, the "Ostensione dei Semplici," was developed; and from this branch grew all the modern schools, chairs and laboratories devoted to the study of nature. In 1543 BONAFEDE, dissatisfied with casually-collected specimens, represented the necessity of a public garden where plants, particularly exotics, could be studied, and for a modern physic garden. Eventually the Council of Prelates was prevailed upon to allocate a site near the Convent of Santa Giustina, and the construction of the Garden was confided to PIETRO DE NAOLE, a professor of medicine, and DANIELE BARBARO, who was later Patriarch of Aquileia. BARBARO was a keen horticulturist and possessed a flourishing garden in Venice.

The work of building the Garden was at once put in hand. Only a few years later the famous KONRAD GESNER affirmed that he had never seen a garden so full of plants or so well kept. It quickly became notable, and Padua's example was almost immediately followed by the universities at Pisa (whose garden is almost contemporary), Florence and other Italian states. Nevertheless, although the Paduan Garden remained tiny in comparison to some of its successors elsewhere, it kept its pre-eminence for a long period and will always be venerated as the first botanical garden established in Europe.

Before the middle of the sixteenth century there were few gardens in Italy where plants of interest were grown though, in Padua and Venice, a number of patricians were accustomed to collect rarities from other parts of Italy and from those countries, particularly the Levant, with which the Republic was linked by trade.

BONAFEDE'S garden was at first devoted entirely to the study of simples and, when completed, it was given in charge of LUIGI SQUALERMO, called "ANGUILARA," who was nominated "Herbario," and "Professor of the Medical Garden at Padua." Out of the study of the medical properties of plants grew an interest in the plants themselves and, under ANGUILARA'S direction, the Garden quickly attracted the attention of the historians of the time.

The late sixteenth-century was the golden age of Italian botany.



Photo, J. E. Downcard

Fig. 230 *Regelo-Cyclis* Iris 'Teucros' P.C. May 23, 1950. Shown by Messrs.
C. G. van 'Tubergen, Haarlem, Holland.

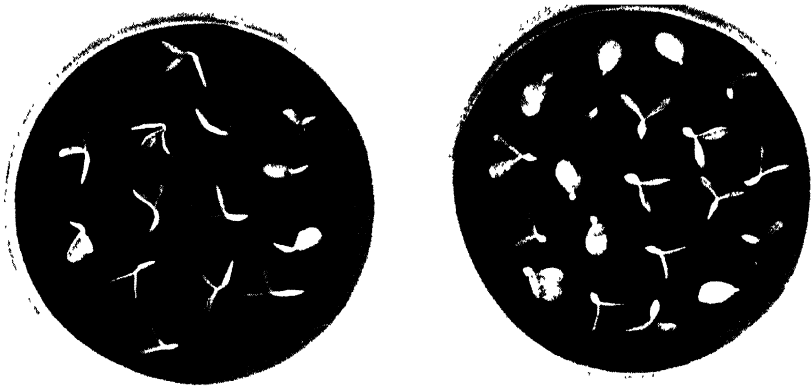


Fig. 231—(Right) Apple seedlings treated with colchicine. (Left) Control
(See p. 466)

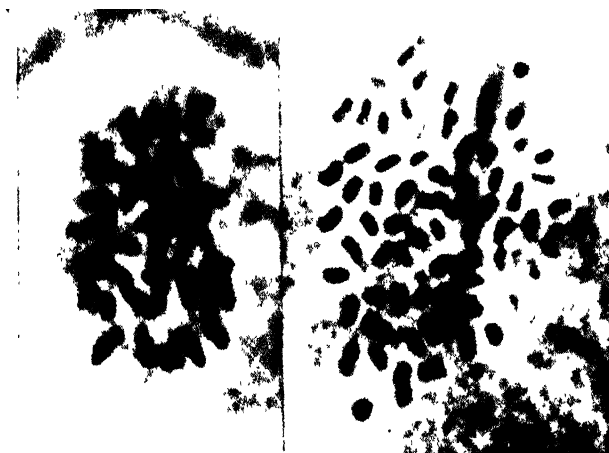


Fig. 232—Radish 'Scarlet Globe,' (Left) normal diploids. (Right) induced
tetraploids (See p. 466)



THE ORIGIN AND IMPROVEMENT OF CULTIVATED PLANTS

Fig. 233—Decapitated Tomato plants with young shoots differentiating



X ca 3000.

Fig. 234—(Right) a Tetraploid cell of an Apple with 68 chromosomes. The result of colchicine treatment. (Left) A normal diploid cell with 34 chromosomes (See p. 466)



THE ORIGIN AND IMPROVEMENT OF CULTIVATED PLANTS

Fig. 235—'Tomato, F_1 line from the variety 'Victor' crossed seedling No. 10
(See p. 470)



Fig. 236—Leaf-mould resistance in Tomatoes. (Right) the susceptible variety 'Ailsa Craig' heavily infected with leaf-mould. (Left) a family of resistant seedlings free from leaf-mould. (See p. 472)



THE ORIGIN AND IMPROVEMENT OF CULTIVATED PLANTS
 Fig. 237—Peaches. (Right) a family without foliar glands badly attacked by mildew. (Left) a family with glands free from mildew. (See p. 473)



Fig 238 - Tomato variety 'Puck' combining the sturdy dwarf habit of the variety the 'First-in-the-Field' and the bush habit of the 'Victor' (See p 473)



THE ORIGIN AND IMPROVEMENT OF CULTIVATED PLANTS

Fig. 239—Apple Seedlings: (Left) immune; (Right) susceptible to Woolly Aphis. Raised from 'Doucine' susceptible, crossed 'Northern Spy' immune (See p. 473)

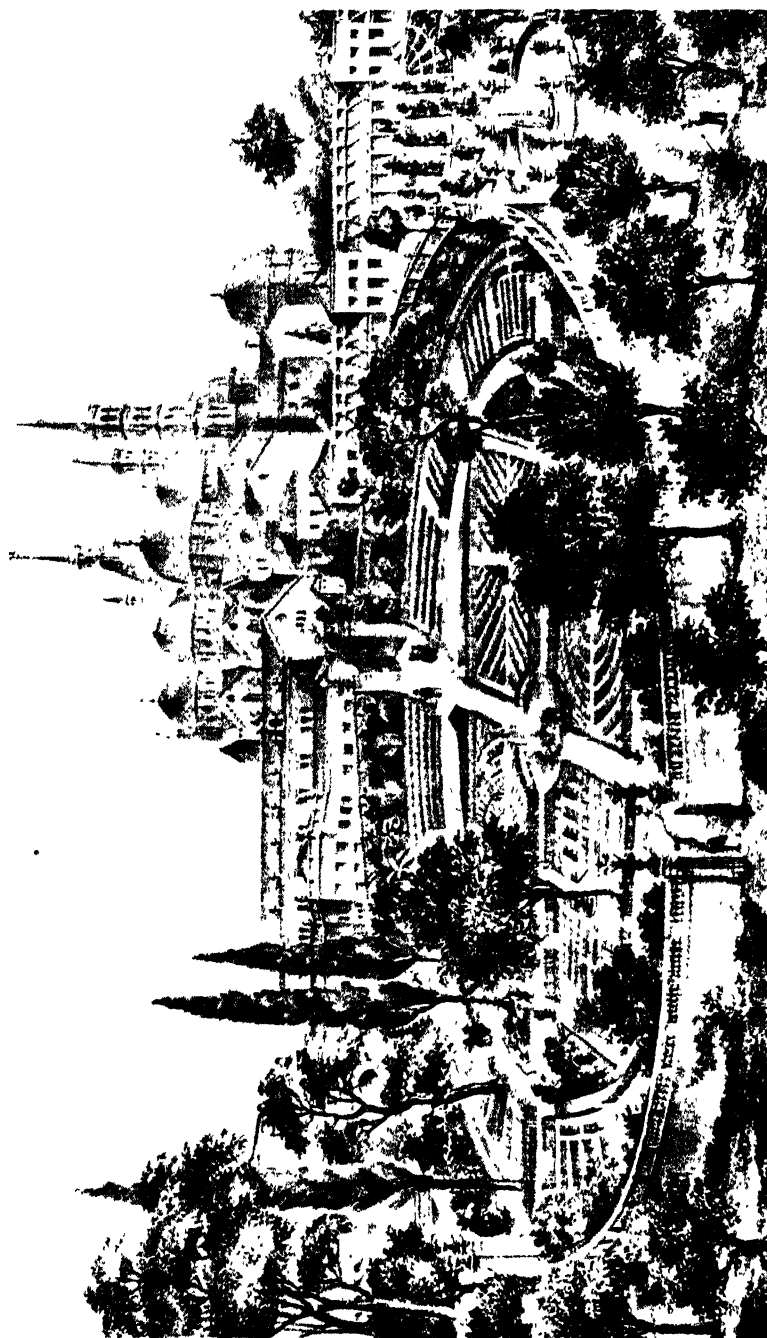
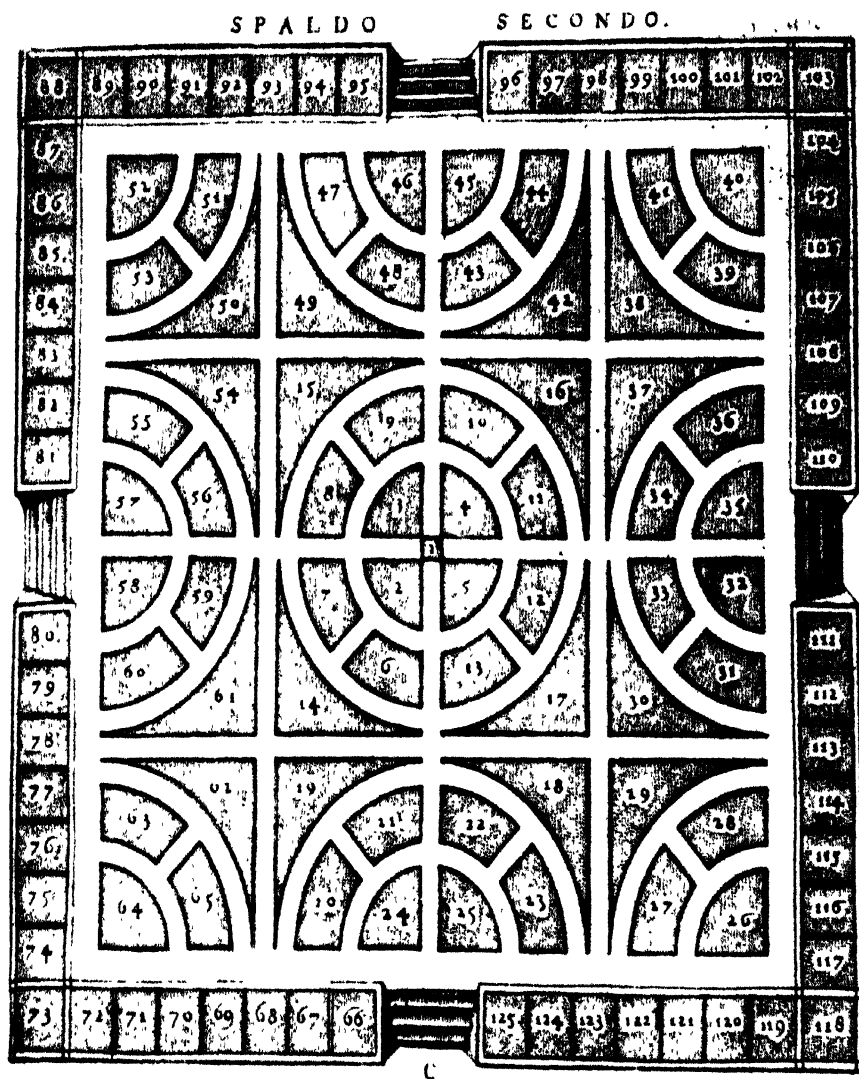


Fig. 240—The "Orto Botanico," Padua, from the *L'Orto Botanico* by Visiani, 1842 (See p. 475)



THE "ORTO BOTANICO," PADUA

Fig. 241- Plan of one of the four original gardens. The numbers correspond to blank spaces in the interleaved edition for students to fill in the names of the actual plants. From *L'Orto dei Semplici di Padova* by Girolamo Porro, 1591



Fig. 242 — "Goethe"
Palm-house in the bac
ground (See p. 478)

THE "ORTO
BOTANICO,"
PADUA

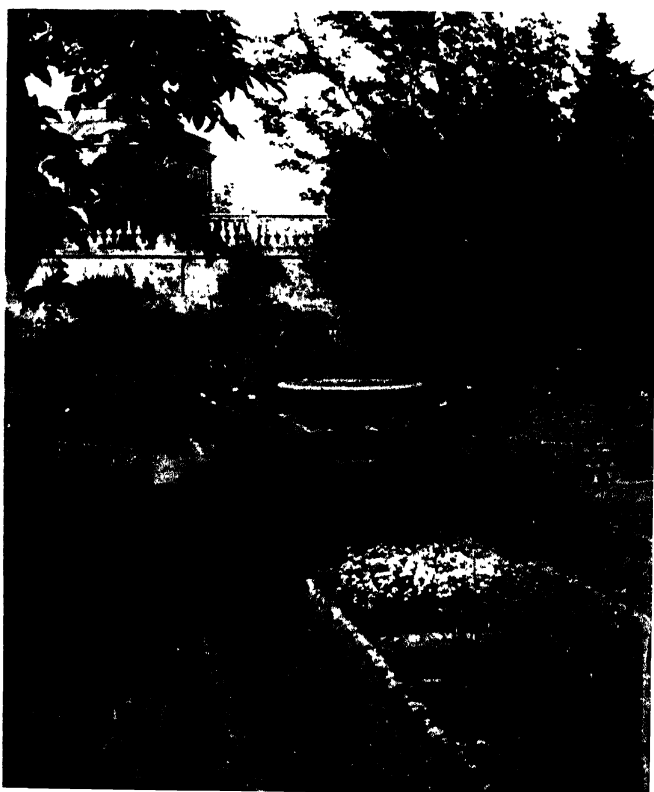


Fig. 243—One of the
circular gardens (See
p. 475)



Fig. 244 --'The White Bougainvillea in Zanzibar (See p. 486)



Fig. 245 --*Eriobotrya japonica*. The Loquat in fruit at Maidwell Hall, Northants.
(See p. 488)

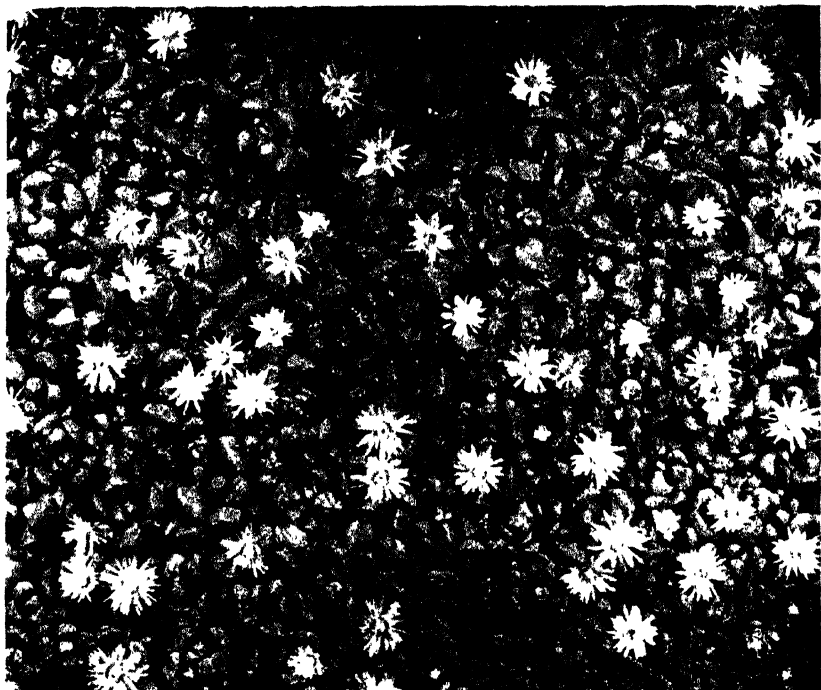


Fig. 246—*Rhinephyllum Broomii* L. Bol. Year old seedlings, $\frac{1}{2}$ (See p. 488)

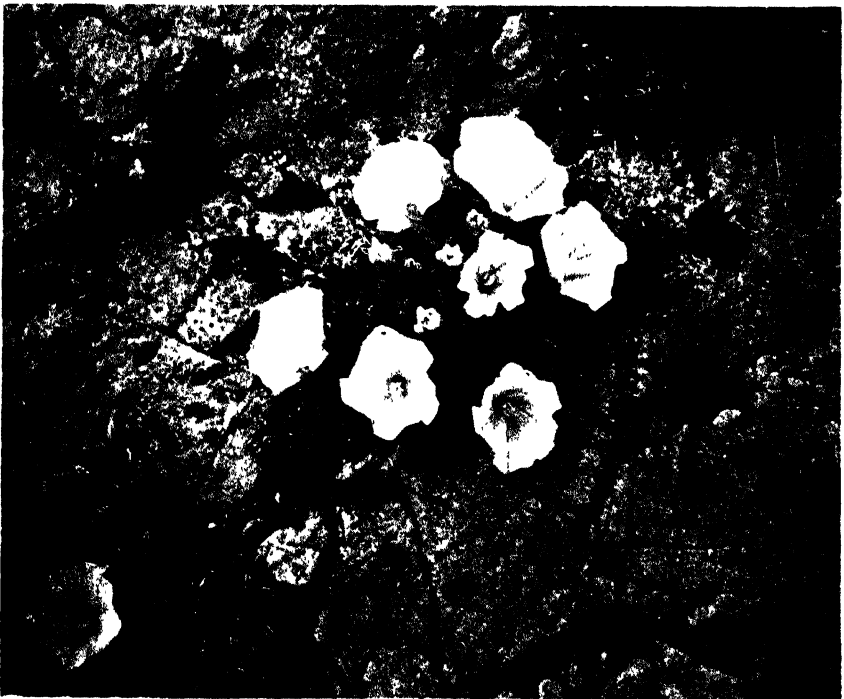


Photos, L. S. Clarke

Fig. 247—*Rhinephyllum Broomii* L. Bol. Close-up of year-old seedling showing expanded capsule with seeds open to view. $\times 3$ (See p. 488) Inset: Seeds germinating direct from capsule. $\times 3$



Fig. 248 *Arenaria tetraquetra* var. *frigida*, Sierra Nevada: Penoñes de San Francisco
(See p. 449)



Photos, P. H. Davis

PLANT COLLECTING IN THE MOUNTAINS OF ANDALUCIA

Fig. 249 —*Convolvulus nitidus*, Pico de Cabañas, Sierra del Pozo Alcon (See p. 478)



Photo, V. H. Heywood

Fig. 250—*Verbascum Hervieri*, Barranco de Guadelentín, Montes de Cazorla (See p. 448)



Photo, P. H. Davis

PLANT COLLECTING IN THE MOUNTAINS OF ANDALUCIA

Fig. 251—*Viola cazorlensis*, Cerro Cabanas, Montes de Cazorla (See p. 449)

ANGUILARA had travelled extensively in the East and devoted himself to enriching the garden with new plants. Not only their cultivation, but also the collection of funds to finance plant-hunting expeditions are frequently mentioned in the early records of the Garden. These expeditions were probably the first of their kind.

ANGUILARA was succeeded by MELCHIRRE GUILANDINO, an equally zealous director (d. 1589), who was the first person to botanise in the field. The next director, PROSPERO ALPINO, was the author of *De plantis Ægypti* and *De plantis exoticis*, which were among the first books dealing with foreign plants, the fruit of his journeys in the Near East. He also, while still primarily interested in medicine, introduced coffee into Italy.

It would be a fascinating, but difficult, study to trace the plants first brought into Europe through the Paduan Garden; but a few are known with some certainty. Of these Oriental Hyacinths, which after years of hybridization became the familiar Hyacinths of our gardens, pots and bowls, are known to have been so introduced. In all probability various species of Tulips were similarly imported, though in the case of both plants the honour of introducing them generally to gardens, and incidentally of starting the extraordinary Tulip mania which swept the Low Countries in the seventeenth century, went to the Dutch successors of Venice's mercantile greatness. The American Agave was growing at Padua in 1561 and the Potato, which reached Italy from England, in 1590. The garden still contains the original oriental Plane brought into Europe, a flourishing veteran which indirectly is probably the ancestor of all the "London" Planes. Other notable trees are the first *Magnolia grandiflora*, and the original *Ginkgo biloba*. All these old trees bear the date of their planting.* It seems clear that long before the Garden officially ceased to be a physic garden, it had become in practice one of great botanical and horticultural interest.

The formal conversion from a medical to a botanical garden in accordance with the new concepts of LINNAEUS took place in the eighteenth century under the guidance of GUILIO PONTERA (1719-1757); but the original lay-out was found equally suitable to the growing of botanical specimens as for the herbs used in medicine. Perhaps fortunately, a project of the Venetian Senate in 1591 to embellish the Garden with fountains and statues had come to nothing and prevented a possible decline into a flowerless pleasure-ground of which there are so many in Italy.

Among the Garden's later directors may be mentioned VISIANI, who made a notable collection of classical authors and published the first work of the flora of the Dalmatian coast, and the distinguished mycologist SACCARDO, who held the Chair until 1915 and built the research laboratories. The Garden is still a centre of research work and thus has an uninterrupted record of service for over four centuries.

To the layman the Paduan garden is a place of singular beauty and charm, apparently preserving, in its most unusual form, the exact shape

* Near by, in the cathedral cloister, is an equally famous *Magnolia*, a tree of such enormous proportions that even the dimensions of the very large cloister fail to dwarf them. When in flower and covered with hundreds of its huge ivory cups it is a magnificent sight. It is probably the largest tree of its kind in Europe.

in which it was laid out in 1545. It is true that the encircling wall and the gates were not completed until the first years of the eighteenth century, but the authorities were wise in constructing a small arboretum outside the Garden proper and in not attempting to grow too many trees in the Garden itself. The same applies to the few glass houses, one of which was built to protect a Palm much admired by GOETHE. This rather ugly structure does not mar the beauty of the almost miraculously preserved garden, while it did not serve to prevent the Palm being killed to the ground in the great frost of 1947-48. Now, however, the tree is throwing up several new heads from the base. (Fig. 242.)

Circular gardens are very rare, and none contemporary with the Paduan garden now exists; although a sixteenth-century print of DUPÉRAC's shows another circular garden, built inside the so-called Mausoleum of Augustus, within which is a series of concentric flower-beds bordered with Lavender or Box. The entrance is a rusticated porch surmounted by a gigantic head. Creepers and Espaliers grow on the walls.

This garden has long ceased to exist; but it may have been inspired by the garden at Padua.

Walking through the Paduan garden past the innumerable little flower-beds, each with its particular plants, one is continually reminded of the great English herbals. It is a surprising thought to realize that this Garden was already matured when those comparatively ancient books first left their printers. With its mellow beauty, its fountains and shade, grateful after the torrid pavements of the city, the continual surprises which it holds for the visitor in the shape of new plants and the intriguing patterns of its flower-beds, it is indeed a place of enchantment.

I am greatly indebted to SIGNOR GIUSEPPE GOLA for leave to quote from his history of the Orto Botanico written to celebrate the fourth centenary of its foundation.

PLANT COLLECTING IN THE MOUNTAINS OF ANDALUCIA

Vernon H. Heywood, B.Sc.

PART II

THE classical areas in Sierra Nevada for plant collectors are the schistose screes and alpine meadows in the region of the three great peaks—the Veleta, Mulchacén and Caballo—and the outcrop of limestone called the Cerro Dornajo whose slopes provide many of Spain's fine plants such as *Convolvulus nitidus*. (Fig. 249.) These we visited again with encouraging success adding scores of plants not seen in 1947. Two of the notabilia were *Chaenorrhinum glareosum*, an exceedingly attractive alpine which has flowered well at Wisley, and *Linaria glacialis*, a curious annual with fleshy whorls of glaucous leaves from which rise overlarge mauve corollas.

There is one area which has been singularly neglected—the Cerro Trevenque whose white dome can be seen from many parts of the Sierra projecting in the seemingly inaccessible distance. The intrepid Swiss botanist, BOISSIER, visited it, as did many other collectors during the golden age of Spanish botany—WILLKOMM, DEL CAMPO, BOURGEOU, and FUNK—but in recent times the Trevenque appears to have been overlooked. It was for us an unknown quantity—rumour had it to be a barren pile covered with *Erinacea Anthyllis*—yet by blind faith we were certain that *Scabiosa pulsatilloides* would grow on it (one of the results of hurried preparations, else we should have known that it did); and it was limestone.

On our last night in the Veleta area we did some rapid bargaining with the shepherds who brought goats' milk to the Albergue Universitaria where we were staying, and secured two mules for an improbable hour the next morning. Although we were over an hour late in starting it was still dark when we left and bitterly cold. Stumbling blindly into the valley of the Rio Genil we could collect only plants such as *Verbascum* which were sufficiently large to be obvious. The climb up the other side of the barranco was dangerous for the beasts; the loose sand of the track frequently subsided and the mules laden with our accumulated collections had to be dragged forcibly to safety.

Soon the sun was high above us and the red sand merged into the grey and white of limestone; and beyond a crest we saw our goal, the Cerro Trevenque, a gleaming white cone rising cleanly above the surrounding plains. The approaches were of sun-scorched shrub—*Erinacea Anthyllis*, *Ptilotrichum spinosum* and its rarer relative *Vella spinosa*, Genistas, Thymes and Honeysuckle, and the giant fruiting spikes of *Asphodel* each with its cluster of spherical capsules.

A halt was made for lunch at the base of the mountain in a small forest of *Pinus sylvestris* var. *nevadensis* which partly covers the eastern slopes. The Pine is stocky and resembles little the northern-European plant in habit; most authorities accept it as truly native thus making the Cerro Trevenque its meridional limit. Evidently it reached this area in its retreat south during the Pleistocene Glaciation.

The nearer one approaches the Trevenque the more remarkable it appears: ridge after ridge of white and grey limestone and marble, churned into pebbles and even powder, sweep down to the surroundings where slight eminences of the same shades cut off little valleys, so that, cindery under foot, it seems like walking through a lime-kiln! It is difficult to conceive of a more xerophytic habitat; but flowering here was Spain's most elegant species of *Echium*—*E. albicans*, a foot or so high and entirely clothed in dense white tomentum spiked by long pellucid-tipped hairs. The young stalked flowers are red when they open and mature a violet-purple.

Leaving our guides with the recalcitrant mules we climbed the eastern ridge to its steep north face; loose chalk and marble overlying firm chalk formed a perilous substrate and the last few yards had to be scrambled over on all fours. A rich reward was found in three superb *Anthyllis*—silver-leaved and saxatile—*A. Tejedensis* with golden globes of Pea-flowers, another related yellow-headed species, and a third

crimson-flowered with leaves like silver spoons. There was seed on all. *Thymus granatensis* var. *longiflorus* was abundant, as was *Convolvulus nitidus*, and at last the object of our climb—*Scabiosa pulsatilloides*. This dwarf scabious rivals *Ptercephalus spathulatus* in exclusiveness and beauty; it grows to a few inches above the white scree and sends out broad violet-blue heads on short stalks from within its divided silver leaves. The excellent plate in BOISSIER's *Voyage** though remarkably fine does it scant justice. Later in the year I collected sufficient seed to establish *Scabiosa pulsatilloides* in cultivation in this country. Our exaltation was completed by finding, scattered on the slopes *Helianthemum pannosum*, another endemic of note. The small caespitose bushlets were densely formed with shortly petiolate leaves clothed in snow-white felt; most of the croceous flowers had dropped off and the succeeding capsules held ripe seed.

The analogies offered by the flora of the limestone areas of the Sierra Nevada are most interesting, especially by this calcareous outcrop of the Cerro Trevenque, just described, above the *Pinus sylvestris* var. *nevadensis* zone. The habitat is ecologically very similar to that outlined in the Sierra de Cazorla (Prado Redondo), and the parallelism of species is striking. *Ptercephalus spathulatus* is not represented here, but *Convolvulus nitidus* grows with the equally beautiful and much rarer Scabiosad—*Scabiosa pulsatilloides*, endemic to the Cerro Trevenque; its associates include *Arenaria armerina* var. *elongata*, *Teucrium flavum*, a *Centaurea* (apparently the same as the Cazorlan form), and *Helianthemum pannosum*.

Certainly a return visit to this isolated haven of fine plants would be rewarding.

Eastwards to Ronda where our arrival at the railway station caused the porter a problem. Ronda was remarkable for one thing at least—on our first morning there we changed our lodging from a pension to an hotel, and left for Grazalema in the afternoon where we descended the scale by sleeping in the *fonda*!

Grazalema—a white village of flat-roofed houses and steep cobbled streets climbing up the mountainside—lies a few miles within the bounds of the province of Cadiz, adjoining Malaga. Our arrival coincided with preparation for the village's Saint's Day, resulting in a marked reluctance of the *fonda* keeper to give us room; and naturally there was considerable difficulty in finding guides. When our comparative wealth became apparent the situation became eased and we left for the mountains in the morning with two young shepherds who, if not excessively obtuse, certainly appeared so! It soon became apparent that it was useless asking them for information for they remained solidly asinine, and as a result any success in finding desired localities was due to the kindness of the Fates.

Grazalema meant two things to us—*Centaurea Clementei* and *Abies Pinsapo*. As the locality for the former could not be traced the only course open was to cover as much likely-looking ground in the time available. On a limestone ridge, the Peñon Grande, above the village, we soon came across the delicate annual *Campanula specularioides*, its

* Voyage Botanique dans le Midi de l'Espagne.

deeply five-cleft violet-blue corollas already withered above its globose capsules. *Saxifraga gemmulosa* was dried up almost beyond recognition. On the dry rocks grew an attractive *Rumex*, a glaucous saxatile shrub covered in showy pale pink-white fruits: it should make a useful "foliage plant." Another inhabitant of these rocks was a prostrate and brittle *Chaenorhinum* with pale-lilac flowers and darker veining; it had all the appearance of *Campanula mollis* and only a closer examination revealed its identity. The *Campanula* grew here also, but no seed of it could be found; indeed *C. mollis* frequently fails to produce viable seed whether in nature or in cultivation.

Two *Phlomis* were collected during the day—*P. crinita* with bicoloured "toffee" hoods and a concolorous form; and the shrubbier *P. purpurea*. Other notabilia included *Biarum arundanum* with both spathe and spadix a shade of maroon; it is apparently endemic to the Ronda-Grazalema region.

Mid day came, and there was no trace of *Centaurea Clementei*; we separated each with a guide: PETER DAVIS to the rocks beyond the Peñon Grande and myself to the Sierra del Pinar, the site of *Abies Pinsapo*. There was no difficulty in finding the Pinsapo for it forms immense dark green masses on the north slopes of the Sierra (1,654 m.). The dense shade afforded by the strong branching of these gigantic trees excludes to a large extent the development of undergrowth: a thick mat of dead leaves and old fruits and seeds covers the floor of the forests. At the present time *A. Pinsapo* survives in an extremely contracted area—on Jurassic limestone in a few mountains in the south, and in Morocco near Xauen. It would seem that the Pinsapo is destined to virtual elimination: Spanish foresters tell the sorry tale of human and animal interference and point to the disappearance of other Mediterranean *Abies* within historic time, such as *A. nebrodensis* from the slopes of Etna in Sicily.

And the *Centaurea*? After a brave search PETER DAVIS came across it on the continuation of the Peñon Grande, 3 or 4 miles south-west of Grazalema. There it sat on treelike stumps of rootstocks emerging from the rock fissures, perennating year after year; its thick woolly-white leaves like paddles and its stems over a foot tall. The vast capitula had shed their yellow flowers, the fruits being surrounded by silvery scales with large shiny brown appendages. A relict and a giant. It is possible that BOISSIER saw these selfsame plants a century ago: a sobering thought indeed.

The evening saw the celebrations of the Saint's Day in full course. Everyone of the villagers turned out for the procession of the Virgin, the Image preceded by tiny acolytes staggering under the weight of heavy crosses three times their height, and accompanied by the Guardias Civiles looking rather self conscious in their ceremonial green uniforms with canary-yellow belts. Then the singing and dancing long into the night.

Leaving the village next morning, we saw from the bus great clumps of *Centaurea Clementei* looking down majestically from overhanging rocks above the road!

The old and new towns of Ronda face each other across the dramatic

chasm of the Tajo. A path leads down to the river flowing through the bottom of the gorge, and on the conglomeratic cliffs grew *Moricandia Ramburii*, a curious Cruciferous shrub; it is many-stemmed from the base, the leaves thick and glaucous and the flowers purple. We managed to break off a few branches and collected some seed from the long narrow siliquae. Growing in the tufa rocks was the perennial *Linaria melanantha*, a species variable in the colouring of its corolla; the delicate glaucescent plants here retained a few flowers of pale lilac with darker striations, shading to buff on the spur. The lip of the corolla was dark maroon-purple.

Other Tajo plants were *Trachelium coeruleum*, *Campanula mollis* var. (without seed) and a perennial *Chaenorhinum* with pale violet flowers. Most of the summer flora was dried up, the season being particularly hot and arid.

Motivated by thoughts of finding the pink-flowered *Leucanthemum arundanum*, we left for Yunquera. The journey, by bus, was a dreadful experience: each minute we seemed doomed to destruction by swerving over a precipice or by colliding head on with a lorry on a steep and narrow mountain road. The least concerned person was the driver who sat nonchalantly, one hand at the wheel and a cigarette drooping from his mouth.

Our plan was to hire mules and make our way back to Ronda through the Sierra de Tolox and the Serrania de Ronda. As this meant a double journey for the mules, and thereby cost twice the price, we left with some misgivings. Not far above Yunquera we rode into a *Cistus-Quercus ilex* scrub: species of *Cistus* and *Halimium* formed a constant cover for some miles with large bushes of *Bupleurum spinosum* as one of the dominants. *Coridothymus* (*Thymus*) *capitatus* was present with a white form frequent among the typical lavender-blue-flowered plants; and the dark purple spikes of *Lavandula lanata* showed up here and there in the grey and green herbage.

After a few miles we came to a zone of *Abies Pinsapo* with *Daphne gnidium* and *Crataegus* draped with mistletoe (*Viscum cruciatum*?). Above the *Abies* were sparse forests of heavily galled *Quercus*, and we started to climb Torrecilla, peak of the Sierra de Tolox. The vegetation was barely interesting floristically—enormous mats of *Juniperus sabina* var. *humilis*, horrid clumps of *Erinacea*, and a touch of colour in *Lactuca viminea*, its pale yellow ligules coppery on the reverse. Evening came and we seemed to have collected not a single plant of note: Torrecilla appeared barren, the scrub and forests below were monotonous. Perhaps we were tired, for Yunquera and its surrounding mountains are noted for the richness of their flora. It seems we had missed not only *Leucanthemum arundanum*, but also *Digitalis laciniata*, *Ononis speciosa* and several others. We reached Ronda by evening, whereupon one of our mules collapsed in a shower of sparks on the cobbled streets throwing our baggage to the ground!

Following a brief interval in Sevilla, we changed our centre to the coastlands and salt flats of Murcia on the south-east seaboard. By now it was late in July and conditions were becoming rather difficult. Théophile Gautier expressed the opinion that one ought to visit

foreign countries in their violent season: from a horticultural point of view this has its advantages when the country is Spain and the region Murcia, for in July nearly all plants have seeded; but the actual plants are mainly shrivelled and useless for botanical collection.

The town of Murcia is dusty above all things else—thick swirling white dust covers everything at the slightest breath of air. It is as though the very buildings are crumbling to powder. Architecturally it has little of distinction apart from the magnificent Baroque façade of its cathedral; botanically and horticulturally it has nothing to offer. The surrounding countryside is steppe, occasionally desert-like, African and barren; great umber mountain ranges break the monotonous skyline.

We took a bus from Murcia through this desolate country towards the coast, halting for a night in the mosquito-ridden port of Torrevieja. Another bus carried us to San Miguel de Salinas, a small village at the edge of the salt marshes. We enquired at the local bar about a thyme which we were looking for—in Spain the country people still show a considerable knowledge of herbs and their medicinal uses. It was not altogether surprising then to be shown a tin full of the Thyme and told that it was used to make a tea-like infusion by putting it through the chromium-plated “express” coffee machine!

Immediately outside the village on the chalky hills along the edge of the Torrevieja road, the Thyme, locally known as *cantueso*, grew in some abundance. The species is a pink-flowered member of the *Pseudothymbra* section and in many respects intermediate between *T. longiflorus* and *T. Funkii*. It has not been previously described but I think it can be accommodated in *T. moroderi* Martinez, based on *T. longiflorus* var. *ciliatus* described by SANDWITH from the Valencian coast. The San Miguel form is not so attractive as the Valencian plant which has sizeable bracts of a dark purple colour, and margined with ciliate white hairs; but we found some good variations here, both as regards flowers and bracts, which should be well worth growing. Little seed was set: the spikes were heavily infested with insects, but up to 90 per cent. germination has been obtained from what seed we did collect.

There were many halophytes amongst the accompanying plants—the fragrant white-flowered *Ptilotrichum maritimum* and orange-headed *Odontospermum maritimum* to mention only two. An interesting find was what purported to be a diminutive form of *Viola arborescens*. Further seawards, on the Salinas de Torrevieja, we collected an unusual *Teucrium* with thick heads of pale lemon-yellow flowers, and several species of *Limonium*—the first of very many.

In the evening we returned to Murcia, only to leave again the next morning, in a large yellow bus, for the naval base of Cartagena where, above the harbour, there grows the magnificent Sea Lavender *Limonium insigne*. In Cartagena the only means of transport available at a reasonable price was a very small taxi. And in this we rode precariously above the harbour to the place known as La Terrosa. Unwittingly we were driving into a protected military zone. Before long we were challenged, but our letters and papers of identity seemed to satisfy the

guards as to our harmlessness, for they allowed us to proceed. Scrambling down the rocks of La Terrosa above the bay, Algameca Grande, it soon became obvious that all was not well: above us soldiers were blasting the cliffs with explosives and great lumps of stone showered down on us! Before our ungraceful retreat we found about ten plants of *L. insigne*; only one was in flower, the rest apparently fruiting, although rarely with seed.

The second locality for the *Limonium* was the eminence above us. Before long another group of guards halted us and this time we were forced to turn back. But the taxi, small as it was, could not turn; nor indeed could it go forward for the engine had stopped. Then followed the harassing experience of freewheeling backwards down the narrow winding road to start up the engine; and as this was not successful we had to continue in this precarious manner all the way down. The brakes, I might add, were very imperfect.

If the above episode sounds like a comic-opera-way of collecting plants, the events that followed during the tracking down of *L. caesium* must be classified as farce. All the information we had about this plant can be summed up as "near Elche."

Elche is easily reached from Murcia by a road which meanders through a Moroccan countryside of undulating sand, and if the palm-shaded landscape suggests North Africa the blue domes and the minarets amidst the flat-roofed white-washed houses confirm the impression.

Our plan in Elche was to produce a specimen of the *L. insigne* from Cartagena and enquire where a similar plant was to be found nearby. The Spanish love this sort of thing; they will stop the normal routine of life and conspire amongst themselves to arrange what seems to the uninitiated a gigantic hoax. The ritual unfolded as follows: one man said that he knew where the plant grew and would return later to show us; another said that it grew by the roadside at the edge of the town. We hired a taxi to investigate. We found blue *Limonium*, white *Limonium*, tall and short, fat and thin *Limonium*, but no *L. caesium*. A third man took us to his house and did in fact produce the desired plant—from a vase where it was being used, very successfully, as an Everlasting. He did not know where it grew. As the first man did not reappear we were forced to seek him out (in a taxi—the same driver—he had become interested); not unexpectedly he produced for our examination a common blue *Limonium*, and insisted, ably supported by the taxi driver, that it was what we were looking for. We were only botanists, we could not argue.

The time grew late; the absurdity increased. Every species of *Limonium* that grows in Spain seemed to have appeared in Elche, and we made expensive taxi journeys to see them! The end was reached after a long day of conference, intrigue and bribery—often beyond our comprehension. The characters involved included a rapacious farmer, a minor government official and a garage proprietor.

A few miles from Elche on the salty flats of El Salvador, near the Palm oases, *L. caesium* grows in wide acres. We were led there by a young man who had collected the plants for the last ten years to spread on the streets of Elche during the festivals of Corpus Christi.

The *Limonium* had long since seeded, cov. ^{the} the sand with a deep layer of fruits; almost unlimited quantities ^{allied} could be scooped up there like wheat from a granary floor.

L. insigne and *L. caesium* are amongst the most beautiful and showy of plants. I cannot refrain from quoting WILLKOMM again: of the former he says, "Planta eximia, generis species elegantissima ac pulcherrima!", while the latter is "Species pariter perpulchra." *L. insigne* is the larger-flowered of the two—the tube of the corollas reaching the magnificent proportion of 4 lines diameter—but its panicles of two-flowered spikelets are smaller and less floribund. And in turn, although the flowers of *L. caesium* are almost half as small as in the other, its profusion of pink one-flowered spikelets forming great pyramidal panicles makes it such a spectacular sight when in full flower that, for me, it is the finer plant.

After Elche we continued our tour of the Spanish Levante and returned through the steppes of Albacete to Madrid.

Many plants and happenings of our journey must be omitted here, such as the intriguing *Teucrium pumilum* found near Alcoy with its procumbent stems appressed to the rocks; *Digitalis mariana* in its *locus classicus*, the rocky hills at the gorge of Despeñaperros in Ciudad Real, looking for all the world like a Mullein; the distant enticing sierras which there was never time to explore; the nightmare journey on the footplate of a railway engine; the sight of our drying paper blown from the roof of our hotel in Madrid being wafted down to the Puerta del Sol. . . .

It would take many, many months to exhaust the wealth of the Spanish flora; we attempted to skim off the cream; but what we left is indeed rich.

THE WHITE BOUGAINVILLEA

R. O. Williams, O.B.E.

FOR many years the White Bougainvillea was no more than a myth but it was not uncommon to meet or be told of people who were convinced that they had seen one.

In 1919 I searched an old monograph of the genus Bougainvillea at Kew but could find no mention of a white species, although I did find reference to some with such uncommon colours as greenish and pale yellowish but, so far as I remember, the bracts were small and inconspicuous. In 1922 I placed on record my subsequent enquiries in the Bulletin of the Department of Agriculture, Trinidad and Tobago, pp. 121-122, which were briefly as follows:—

A lady from Rangoon volunteered the information that a white Bougainvillea was in cultivation in Burma, but the reply to enquiries was that none of the Botanists, Agriculturists or Forestry Research staff had heard of, or seen the plant in Burma. Someone suggested to try Mauritius but on making enquiries of the Director of Agriculture there

he replied "The white *Bougainvillea* does not occur in Mauritius." He continued by saying that he had made enquiries from a number of horticultural amateurs, ~~one of~~ whom stated that he recollected having seen mention of the white *Bougainvillea* being in the forests of Trinidad! The writer is very familiar with these forests and *no* *Bougainvillea*, let alone a white one, occurs in them.

In reply to an enquiry of the Superintendent of Botanical Gardens Cuba he said "We have no white *Bougainvillea*, our small plant having died."

There the matter rested, so far as I was concerned, until some time in the early 30's when the late MR. H. A. BALLOU drew my attention to a few pure white bracts on a large inflorescence of the Ecuador pink *Bougainvillea* ('Lady Hudson') in Trinidad; there was no recurrence of this and the white portion was not propagated. It was not until 1939 that the White *Bougainvillea* was actually introduced from Brazil to Trinidad by DR. S. C. HARLAND, through the courtesy of DR. K. BARTLETT of Porto Rico. I was not there at that time and I have no particulars as to its origin, whether it was a horticultural sport or seedling or had been found in a wild state.

The original plant grew well in Trinidad and was quickly propagated; a few years later I had a magnificent specimen at my residence growing down over a 12-15 feet wall and the admiration of everyone.

The plant is typically of scrambling, semi-climbing habit but it grows well in bush form. The flowers are borne all along the upper parts of the branches or in more or less compact sprays at the tips. In detail the bracts are pure white with greenish centres, the true flowers having a green tube, with a green and yellow corolla when expanded. In a group of plants such as the *Bougainvilleas* noted for their brilliancy of colour it is difficult to particularize, but it may be said that the white ranks with the best of them. The leaves are oval and tapering at both ends and entirely without hairs.

In due course I sent a plant from Trinidad to an old acquaintance MR. W. G. KAYE of Guildford. In 1947 I saw a small spray of bracts exhibited by him at a Royal Horticultural Society's show in Vincent Square. Kaye had passed on a plant to Kew and in November, 1948, at the request of the British Resident, Zanzibar, SIR VINCENT GLENDAY, K.C.M.G., O.B.E., I brought by air to Zanzibar the white *Bougainvillea*, and so far as I know this was its first introduction to East Africa. It was planted in the gardens of the Residency and has since made wonderful progress; the illustration (Fig. 244) was taken about 18 months after planting out. Subsequently plants were taken from this to Kenya and one, at least, has become established at the Municipal Park, Nairobi, and another in front of the offices of the Provincial Commissioner at Kisumu.

The plant is comparatively easy to propagate from the slender tips, in sand or soil. Tropical Agriculture Vol. XXVI, p. 4, suggests a method whereby 100 per cent. success was obtained by dipping the cuttings in paraffin wax and treating with hormone powder. I have rooted them myself by merely placing small cuttings in the soil at the root of the parent plant.

NOTES FROM FELLOWS

Cuttings of Deciduous Conifers

MAJOR PAM and other Fellows may be interested to know that another deciduous tree, very closely allied to the conifers, *Ginkgo biloba*, will root from dormant wood.

A neighbouring tree having fallen into the hands of a speculative builder I took a few cuttings from it on March 6, 1939, and, the war having upset his plans, another lot on January 9, 1944. Some were put in out of doors and others in a box of sand and peat in a cold frame in a shady place. Those out of doors died, but on each occasion those in the frame produced a small number of plants sufficiently well rooted to pot up in August.

The 1939 lot were eventually inadvertently trodden on and destroyed. Those rooted in 1944, produced nothing but rosettes of leaves—bigger and better each year—with no more than the consequential “spur” growth until this spring when they started to grow vigorously and have now much more than doubled their length.

My experiments were made in a haphazard way and with a handful of cuttings only and I have no doubt that an experienced propagator with heat and proper equipment could root cuttings of dormant wood easily.

MILES HADFIELD

Rhinephyllum Broomii L. Bolus

A choice stemless Mesembryanthemum

Of sixty-five batches of *Mesembryanthemum* seed MR. H. HERRE, of Stellenbosch, generously sent the John Innes Horticultural Institution for germination tests in 1949, no species proved a more welcome surprise than this. Its habit recalls that of *Titanopsis*, large white pustules covering the almost globular leaf tips, which are further adorned by small projecting horny teeth. Unlike the notoriously delicate *Titanopsis*, however, *Rhinephyllum Broomii* is vigorous and quick-growing, speedily forming lateral shoots and a tuft of several heads. The calendar of its progress in 1949 was:—

DATE	DAYS AFTER SOWING	
April 26.	0	100 selected seeds sown (by standardized procedure) in J.I. Seed Compost.
May 9.	13	3 seeds germinated. (Unhappily these damped off.)
May 21.	25	3 more seeds up. No further damping off noted. Others germinated at intervals up to
June 3.	38	36 up. Rapid growth beyond cotyledon stage.
August 5.	101	38 now up. Lovely, grey incrustated rosettes, uniformly 2-2.5 cm. across and averaging 4 pairs of leaves each.
Aug. 15.	111	Pricked out into rectangular trough of J.I. Potting Compost 1.
August 29.	125	First 2 flowers opened. Others followed in increasing numbers, but exact records were not kept.

The final germination figure was rather low: 41 per cent. The most striking inference from the above figures is that, discounting the three seedlings which damped off, the first flowers opened just *100 days after the seed germinated*. I must confess that, without my own record book before me, I should not have believed anyone claiming to bloom stemless *Mesembryanthema* in $3\frac{1}{2}$ months! (Incidentally, the annual species are even quicker to mature, four forms of *Dorotheanthus* expanding their first buds within 2 months of germinating.)

Nor is early flowering the only virtue of *Rhinephyllum Broomii*. I wish now I had recorded the total flower output for each plant: the number produced must be astonishing. The yellow blooms, though small (they average 1.5 cms. diam.), seem to come in succession without a break for the whole summer. They expand for a rather short daily period from 5.0 P.M. to dusk, when the effect of constellations of gold from a large pan, as that in the photograph (Fig. 246), is for ever pleasing.

Shortly after this photograph was taken, it was noticed that seed had set and was germinating freely round the parent plants, both in the soil and from fallen capsules, and even from capsules still attached to the plant. Fig. 247 (inset) shows whole fruits sprouting seedlings, some of which make their entry into the world via the capsule walls.

Rhinephyllum first met the eye of gardeners as a new genus in July 1927, when N. E. BROWN defined it, basing it on two recently discovered plants, in the *Gardeners Chronicle*. MRS. BOLUS described *R. Broomii* in her "Notes on Mesembryanthemum," III, 14, nine years later, and followed it by a review of the genus on pp. 40-43, where eight species are keyed: at least two more have been added since then.

Fig. 247 shows the open cells of the fruit which serve to distinguish the genus from the closely allied *Stomatium*.

On the strength of its dainty habit, vigour, and profuse flower production, *R. Broomii* should prove an ideal plant for beginners in Ficoideaceae. I hope dealers will be quick to multiply it now seed is available.

I should add that my own was received under the unpublished name '*Rhinephyllum* ?*Borreri* L. Bol.'—doubtless a result of label misinterpretation.

GORDON ROWLEY

Eriobotrya japonica

In 1948 and again in 1950 a bush of *Eriobotrya japonica* fruited in this Northamptonshire garden. Each of the previous years was unusually hot so that the wood was well ripened. The flowers, which so much resemble a Hawthorn both in appearance and scent, were fully out in December and January, and the orange fruits were ripe by the end of August. These are edible, though not particularly luscious, and contain one to five large seeds which have the appearance of miniature horse chestnuts. They germinate freely even in the open ground. (Fig. 245.)

The bush is some 12 feet high and as much across, and is planted in a south-east corner with wall protection. In this situation it has never suffered the smallest injury from frost or cold winds even in the most severe winters. It will be noticed from the photograph that the

leaves of this particular specimen are much narrower and smaller than those usually seen and this supports the contention that those forms of evergreen shrubs with narrower leaves are usually more hardy than those whose leaves are broader.

The Loquat was introduced into this country in 1787, but it does not seem to be grown extensively except in the south-west; perhaps the propagation of hardier forms would lead to a wider distribution.

OLIVER E. P. WYATT

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1950

Buddleia Davidi 'Royal Red' A.M. August 1, 1950. An attractive seedling with dense panicles of Imperial Purple (H.C.C. 33) flowers with orange throat and eye and slightly frilled corolla. The colour of the flowers contrasts well with the dark green of the oblanceolate leaves, which are greyish-white beneath. Exhibited by Messrs. R. C. Notcutt, Ltd., Woodbridge, Suffolk.

Cotoneaster 'Sabrina' A.M. September 26, 1950. A very decorative plant, believed to have arisen from a chance cross between *C. horizontalis* and *C. pannosa*. The gracefully arching and spreading branches reach a height of five feet. The branchlets are evenly clothed with thick, dark green, ovate leaves an inch long, and clusters of from two to six ovoid Capsicum Red (H.C.C. 715) berries about one-half inch long. Exhibited by N. G. Hadden, Esq., Underway, West Porlock, Somerset.

Gaultheria semi-infera A.M. September 26, 1950. A delightful evergreen shrub for woodland or partially shaded rock garden. The arching growths bear ovate-lanceolate, evenly serrate leaves two or three inches long, glossy above and pale beneath. From their axils spring dense racemes of small, egg-shaped berries varying in colour about Princes Blue (H.C.C. 745/1). Exhibited by N. G. Hadden, Esq., Underway, West Porlock, Somerset.

Gaultheria tetramera A.M. September 12, 1950. A very ornamental evergreen shrub two to three feet tall. The finely-toothed lanceolate or elliptic leaves are about two inches long, lustrous green above, paler beneath. The small Sea Blue (H.C.C. 043/1) berries are carried in dense axillary clusters. Exhibited by Messrs. Hillier & Sons, West Hill Nurseries, Winchester.

Hydrangea villosa A.M. August 29, 1950. A striking deciduous shrub discovered by E. H. Wilson in W. Szechwan in 1908. The lanceolate or elliptic, finely denticulate leaves, six to eight inches long, are notable for their deep and rich colour which matches the Spinach Green of the Colour Chart (0960). The flower-heads are terminal on young shoots, about six inches across, and comprise a central mass of small fertile flowers coloured Aster Violet (H.C.C. 38/1) surrounded by a dozen sterile flowers each with four crenate, orbicular petals over half an inch long, varying about Phlox Purple (H.C.C. 632/2). Exhibited by W. Bentley, Esq., Quarry Wood, Burghclere, Newbury.

Rhododendron prunifolium A.M. August 1, 1950. A deciduous species belonging to the Series Azalea, which is especially valuable on account of its late flowering season. The flowers are $1\frac{1}{2}$ inch across, saucer-shaped with a slender tube $\frac{1}{2}$ inch long, borne about nine together in flattish trusses. The colour is Vermilion (H.C.C. 18/1). The leaves are pale green, oblanceolate, cuneate at the base and strigose on the midrib beneath. Exhibited by The Commissioners of Crown Lands, The Great Park, Windsor.

Rosa Moyesii 'Geranium' A.M. August 29, 1950. This compact variety of a popular Chinese species originated at Wisley. The rich orange-scarlet, flask-shaped hips, for which the award is given, are two inches long, and hang from the branchlets in clusters of from three to six. Exhibited by A. T. Johnson, Esq., Bulkeley Mill, Tyn-y-Groes, Conway.

BOOK NOTES

"Orchids their Description and Cultivation." By Charles H. Curtis. Crown 4to. 288 pp. (Putnam & Co. Ltd.) £4 4s.

This is essentially a book for the amateur. All Orchids of horticultural interest are dealt with, and also others that are of special interest. In the first chapter much information is given on the early history and cultivation of Orchids. The author rightly states that the progress made in the importation and cultivation of exotic Orchids is one of the most remarkable developments that horticulture can show. Subsequent pages deal with the distribution of the various species, "What is an Orchid? Variation of Growth, and Mimicry." Amateurs who desire to try their hand at seed-raising will be interested in the chapters on pollination and germination, but no information is given on present-day methods of raising seed on nutrient agar, for the author considers that laboratory methods are expensive and demand the most meticulous attention in every detail; they are only for the big commercial raisers and wealthy amateurs.

Much useful information is given on the structure of an Orchid house, and such matters as temperatures, ventilation, watering and potting materials are fully treated. The main part of the book is taken up with an enumeration of the general species and hybrids. The descriptions are in simple language, and will prove of considerable value to amateurs, not only in Great Britain, but in all parts of the world where Orchids are cultivated. Under the title "Monthly Reminders," details will be found of the principal requirements which are necessary throughout each month of the year. At the end of the volume there is probably the most extensive Orchid bibliography yet published, although one fails to find mention of the several important works which SCHLECHTER wrote on the *Orchids of South America* or of the *American Orchid Society Bulletin*, of which nearly nineteen volumes have been completed.

The book is elegantly produced and the thirty coloured plates are among the finest of their kind that have so far been prepared. In addition there are forty-eight attractive illustrations in monochrome. The author is a well-known authority on Orchids, and the completion of his latest book has been awaited with much interest. Expectations that the work would be of high quality have been amply fulfilled. A copy of the book should be in the library of every Orchid amateur.

GURNEY WILSON

"Orchids and How to Grow Them." By Adelaide C. Willoughby. 135 pp. (Geoffrey Cumberlege. Oxford University Press, London.) £1 1s.

The purpose of this book is to help and encourage the amateur Orchid grower to know and grow these plants, and to show how economically they may be cultivated. Commencing with a chapter on the "Life Secrets of the Orchid", which will be read with interest by all lovers of plant life, there is an extensive account of the Orchid family. Descriptions are given of suitable glass structures, and in the chapter on "Proper Orchid Balance" the differences of growing plants 'soft' or 'hard' are explained. The author states that it is imperative that the plants have water with an acidity reading of approximately 4.5 to 5 pH. The important matter of potting is adequately dealt with, and several pages are occupied with the treatment of pests and diseases. The method of germinating Orchid seed on nutrient agar is described, and two reliable formulae are

given. The subject of another chapter is the cultivation of Orchids on gravel with artificial feeding. Finally, there are lists of suitable Orchids for different temperatures, and another on "Prize-winning Hybrids." Sixteen pages of illustrations add much to the usefulness of this book. Although not a Californian by birth, the author has lived there since childhood.

GURNEY WILSON

The Propagation of Alpines. By Lawrence D. Hills. 464 pp. Illus (Faber & Faber.) £1 5s.

This large volume contains not only the lifetime experience of its author in the propagation of alpine plants, but also the fruit of much study and research. It would seem that every method of propagation of alpines is described, and a comprehensive list of plants with the methods appropriate to each is included. Where cuttings are concerned the exact season when the largest number may be expected to root is given, a most important but not often easily obtained piece of information. The use of various root promoting preparations is helpfully discussed.

The author has arranged his vast mass of information on what, superficially, might seem a somewhat limited subject into a system which enables any required item to be found without difficulty. The book appears to be intended primarily for trade growers, but no one interested in plants could fail to derive profit from it.

Numerous photographs and more valuable still, line drawings, illustrate multifarious points on which this remarkable book touches.

MORTON

"Better Hedges." By Roy Hay. 19 pp. and 5 illustrations. (Roy Hay Publications). 1950. 1s. 6d.

This pamphlet describes the planting and maintenance of garden and farm hedges with rather long lists of hedge plants. It begins with a short discussion of hedges followed by notes on planting, after care, the maintenance of neglected hedges and farm hedges, the whole condensed into three pages. Nine pages are then devoted to short descriptions of hedge plants and their suitability for various positions, which are followed by two and a half pages descriptive of hedge cutting with modern labour-saving machinery, the pamphlet being ended by "six major factors leading to better hedges." The six factors are condensed into 73 words. Actually it is a disappointing work, the subject matter being badly balanced; nearly as much space is given to hedge cutting with modern labour-saving machinery as to the whole of the general description of hedges, planting and cultural operations, while for such a small work the selection of hedge plants is excessive.

W. DALLIMORE

"Laboratory Methods of work with plants and soil Nematodes." Technical Bulletin No. 2. By T. Goodey D.Sc., F.R.S. Royal 8vo. Illus. (H.M.S.O.) 9d.

This bulletin deals with the details of the methods which have proved serviceable in the writer's experience and includes methods in frequent use at Rothamsted. It is intended for the laboratory worker and should prove a standard and most valuable work for the investigator of Nematodes.

"Asparagus." Bulletin No. 60. Royal 8vo. Illus. (H.M.S.O.) 1s. 6d.

There seems to be an unsatisfied demand each Spring for good quality Asparagus and consequently intending growers should welcome this practical and authoritative booklet compiled under the auspices of the Vegetable Group of the National Agricultural Advisory Service.

"Flowers to Know and Grow." By Audrey Wynne Hatfield. Demy 8vo. Illus. (Castle Press.) 12s. 6d.

This book contains a number of small tinted drawings of individual flowers together with notes on them. Unfortunately the colouring of the drawings has not been done to coincide with the actual colouring of the flowers. Consequently the effect is somewhat unreal. Much of the material has been published previously in the form of four little books following the seasons. The present arrangement of the book seems to be quite haphazard as is also the capitalization of the specific names.

"Modern Glasshouse Flowers for Profit." By W. E. Shewell-Cooper. Demy 8vo. 207 pp. Illus. (Benn.) 10s. 6d.

This book is intended as a companion volume to Lt.-Col. Shewell-Cooper's volume on *Modern Flower Growing for Profit* which was published in 1935. The author points out that the demand for flowers still greatly exceeds the supply and that therefore any grower contemplating going in for flower growing should have no difficulty in finding a market for his produce. Nevertheless, conditions have changed much in this respect during the last year, and prospective growers would be well advised to inquire thoroughly as to their markets before embarking on what is undoubtedly a hazardous, albeit in many ways, very pleasant and sometimes also profitable profession. All such growers will be well advised to read also Mr. Secrett's excellent article on "Present-day Problems of the Horticultural Industry" in the May number of this Journal.

This book deals with the construction of suitable glasshouses, soils and composts, pests and diseases, while there are sections on individual genera, suitable for growing commercially.

"The Observer's Book of British Ferns." By W. J. Stokoe. 128 pp. Illus. (Warne.) 5s.

This is a new popular work on the British Ferns, and, with the exception of Jackson's *Wayside and Woodland Ferns* and Hyde and Wade's *Welsh Ferns*, it is the only modern work on the subject. The nomenclature has been brought into line with A. B. Jackson, who followed Christensen's Index and there is a useful introduction and glossary which explains the meaning of the scientific terms employed. There are some curious statements as, for example, the remark that *Isoetes echinospora* is found in Dorset. So it is, but it is a very widespread species found in many other places. On the whole this is a very useful addition to the series of Observer's Books.

A. H. G. ALSTON

"Recent Advances in Fruit Juice Production." (Technical Communication No. 21, 1950.) Edited by Dr. V. L. S. Charley. 176 pp. Illus. (Commonwealth Bureau of Horticulture and Plantations Crops.) 15s.

The great technical advances which have been made since the publication of "Fruit Juices and Related Products" in 1939 are adequately described in this greatly enlarged and revised edition. Each of the twelve chapters is written by an expert and the book, which is edited and partly written by Dr. Charley, the recognized authority in this field, will rank as the standard work on the subject in this country.

Almost every aspect of the production of fruit juices, syrups and related products is described, including general developments in processing, canning and bottling of fruit juices and modern methods of concentration and storage. Particular attention is paid to the retention of the original vitamin content of the juices and in this connection the value of de-aeration and pasteurization is emphasized.

The greatly increased use of refrigeration in the processing of fruit juices is a noteworthy feature of the modern methods; this with the lower temperatures which are now employed in the concentration of fruit juices (especially citrus and apple juices), and in the storage of the juices or syrups, has resulted in the manufacture of products of greatly increased freshness of flavour and with increased retention of vitamins. The importance of such advances in technique is very great and the high quality of the products will surely prove a decisive factor in the development of the industries concerned.

In view of the important rôle of pectin in the processing of fruit juices, the chapter on "Pectin-degrading enzymes and their implication in the Fruit Products Industry" is most welcome.

The text is admirably supported by numerous excellent illustrations. This well-planned book contains a wealth of technical information of the modern methods now available and will prove invaluable to the industry and to all those directly interested in the many problems associated with the processing of fruit juices.

S. W. CHALLINOR.

The A.B.C. of the Rock Garden and Pool. By W. E. Shewell-Cooper. 209 pp. Illus. (English University Press, Hodder & Stoughton.) 4s. 6d.

This little book has evidently been found helpful in the past, for it is, the author tells us, the amalgamation of two books, one on Rock Gardens and another on Garden Pools which sold well before the war.

To 'Bronze Amber Vale,' as an exhibition variety (votes 9 for, 3 against), shown by Mr. J. W. Checklin, School Lane Nursery, Stonebroom, Derbyshire.

To 'Golden Sceptre' 'Valentine,' (votes 8 for, 4 against in each case), and 'Capable' (votes 11 for, 0 against), as exhibition varieties, shown by Messrs. H. Woolman, Sandy Hill Nurseries, Shirley, Birmingham.

To 'Peak Pearl,' as an exhibition variety (votes 11 for, 0 against), shown by Messrs. J. T. Johnson, Tibshelf, Derbyshire.

Selected for trial at Wisley

'Alice Brown,' J. J. Barnett,' and 'Yellow Barbara,' from Mr. W. B. Jackson, Brown Heath Nursery, Waverton, Chester.

'Burpham,' 'Chancellor,' 'Pirate,' and 'Corncob,' from Messrs. Greenyer Bros., Broadwater Green, Nurseries, Worthing, Sussex.

'Prima Donna,' 'Ice Cap,' 'Gladys Case,' and 'Dorothy Wearing,' from Messrs. H. Shoemsmith, Ltd., Mayford Nurseries, Woking, Surrey.

'Snow Gilt' and 'Charming Maid,' from Mr. E. Riley, Brookside Nurseries, Alfreton, Derbyshire.

'Bronze Amber Vale,' from Mr. J. W. Checklin, School Lane Nursery, Stonebroom, Derbyshire.

'Cream Youth' (sport from 'Youth'), from Mr. J. W. Forsyth, Putteridge Nurseries, Luton.

'Golden Sceptre,' 'Valentine,' and 'Capable,' from Messrs. H. Woolman, Shirley, Birmingham.

'Peak Pearl,' from Messrs. J. & T. Johnson, Tibshelf, Derbyshire.

Other Exhibits

'Royal Copper' and 'Royal Amber,' from Messrs. Robert Wright & Son, Halsall Lane Nursery, Formby, Nr. Liverpool.

'Perfect' (to be seen again), from Mr. W. B. Jackson, Waverton, Chester.

'Magic' (selected for trial 1948) and 'President,' from Messrs. Greenyer Bros., Worthing, Sussex.

'Bronze Una' (selected for trial 1948), from Mr. G. R. Bacon, Heathfield Nurseries, Ecclehill, Bradford.

'Dreamer,' 'Delicacy,' (A.M. 1949), 'Serenade' (A.M. 1948), 'Golden Harvest' (A.M. 1947), 'Roseligh' (A.M. 1947) and 'Arthur Ward' (A.M. 1949), from Messrs. H. Shoemsmith, Ltd., Woking, Surrey.

'Gold Delight' and 'Orchid' (to be renamed), from Mr. E. Riley, Alfreton, Derbyshire.

'Sylvia,' from Mr. J. W. Checklin, Stonebroom, Derbyshire.

'Bronze Duchess,' from Messrs. S. Stepney & Sons, Mitcham.

'Carlotta,' from Mr. J. W. Cooper, Wrexham.

'Red Barbara,' from Mr. L. A. Simpson, 242 Alcester Road, Birmingham.

'Cinnamon,' from Mr. J. E. Player, 25 Castle Road, North Finchley.

'Avocet,' from Messrs. H. Woolman, Shirley, Birmingham.

'Bronze Duchess,' from M. C. Field, 1 Gloster Villa, Bath.

'Happiness,' 'Tricia Lowe' and 'Red Lady,' from Mr. H. Lowe, Tibshelf, Derbyshire.

SEPTEMBER 20, 1949

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and nine other members present.

Aberrant growth in Clivia.—The Hon. L. Palmer showed a fruiting inflorescence of *Clivia* bearing a leaf at the top of the scape just below the umbel with some scarious bracts in its axil. Apparently the leaf in the axil of which the inflorescence had been produced had been carried up at the top of the scape instead of remaining at its base.

Fasciation.—Mr. P. Chandler of Wokingham sent a fasciated stem of Vegetable Marrow which had produced numerous normal lateral branches, on one of which a normal Marrow had been produced. He also sent a fasciated stem of *Tropaeolum speciosum*.

Variation in Celery.—From the same garden a variegated leaf of Celery was shown; the lower leaves showed the phenomenon most clearly, the upper ones tending to become quite green.

Germination in rolls of filter paper.—The Secretary drew attention to an article in *Garten-Zeitung*, the organ of the Austrian Horticultural Society of Vienna, describing the germination of seeds laid in a line on filter paper which was then rolled, the roll being stood on end in a vessel with a little water so that it was kept constantly damp. The seedlings after germination could be easily removed and pricked out.

Iris fruits.—Col. F. C. Stern showed fruits of *Iris* 'Cacique' of very large size. This *Iris* is a cross between *I. fulva* and *I. savannana* one of the group of Louisiana Irises of which many forms exist in the wild.

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRETT, C.B.E., F.L.S., V.M.H., in the Chair, and fourteen other members present.

Exhibits

Awards Recommended:

Silver-gilt Knightian Medal

To Royal Air Force Unit Farms and Gardens, c/o Chief Horticultural Officer, Air Ministry, E46, 46 Draycott Place, London, S.W. 3, for a group of mixed vegetables.

Hogg Medal

To Winkfield Manor Nurseries, Ascot, Berks., for a group of Apples and Pears.

Selected for Trial

Blackberry 'Denver Thornless,' from George Pyne, Esq., Denver Nurseries, Topsham, Devon.

Other Exhibits

Unknown Apple, from E. B. Jarvis, Esq., C.M.G., Waynflete, Ross-on-Wye, Herefordshire.

Apple, 'Andrew Johnson,' from Forestry Department, Isle of Man Board of Agriculture and Fisheries, St. Johns, Isle of Man.

Apple Seedling, from Thomas Maassen, Esq., 3 Newman Road, Hayes, Middlesex.

Apple Seedling, from A. J. Aplin, Esq., Beaufort Market Gardens, nr. Basingstoke, Hants.

Apple Seedling, from Mrs. L. A. B. Satterthwaite, 16 Ravenscroft Park, High Barnet, Herts.

Apple 'Sunset,' from Messrs. Wm. Rogers & Son, Court Lodge, Horton Kirby, Kent.

Peach Seedling, from Miss N. M. Hinkley, 34 Salisbury Road, Carshalton, Surrey.

Apple Seedling, from Mrs. L. Nash, 177 Chiltern Road, Dunstable, Beds.

Apple Seedling, from P. W. Saunders, Esq., Lower Hacketts, Brickendon, Hertford.

Apple Seedling, from C. D. Saunders, Esq., Hacketts Barns, Brickendon, Hertford.

Peach Seedling, from Canon St. John Wayne, Conington, Peterborough.

Tomato 'Ivory White,' from C. Ingram, Esq., Benenden, Kent.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and sixteen other members present.

Awards Recommended:

Gold Medal

To Mr. Stuart Ogg, Swanley, for an exhibit of Dahlias.

Silver-gilt Flora Medal

To Messrs. A. G. Vinten, Ltd., Balcombe, for an exhibit of Chrysanthemums.

Silver-gilt Banksian Medal

To Messrs. Brown & Such, Ltd., Maidenhead, for an exhibit of Dahlias.

To Mr. A. E. Cocks, Hockley, for an exhibit of Dahlias.

Silver Flora Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations and *Dianthus Allwoodii*.

To Mr. J. R. Bell, Horam, for an exhibit of Chrysanthemums.

To Messrs. T. Carlile, Ltd., Twyford, for an exhibit of Asters and other herbaceous plants.

To Messrs. C. Gregory & Son, Ltd., Chilwell, for an exhibit of Roses.

To Messrs. J. F. Spencer & Son, Ltd., Hockley, for an exhibit of Dahlias.

To Messrs. W. Wood & Son, Ltd., Taplow, for an exhibit of Asters and Dahlias.

Silver Banksian Medal

To Messrs. J. Cheal & Son, Ltd., Crawley, for an exhibit of Dahlias.

To Messrs. Hewitt & Co., Stratford-upon-Avon, for an exhibit of Dahlias.

To Messrs. Kelway & Son, Ltd., Langport, for an exhibit of Gladioli.

To Mr. A. Miles, Bickley, for an exhibit of Asters and other herbaceous plants.

Flora Medal

To Messrs Hale & May, Ltd., Cookham, for an exhibit of Asters and other herbaceous plants.

To Home Meadows Nursery, Martlesham, for an exhibit of Dahlias.

To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of herbaceous plants.

To Messrs. Ryder, Ltd., St. Albans, for an exhibit of bedding Dahlias.

To Messrs. Wheatcroft Bros., Ltd., Ruddington, for an exhibit of Roses.

Banksian Medal

To Messrs. B. R. Cant & Sons, Ltd., Colchester, for an exhibit of Roses.

To Messrs G. & A. Clark, Ltd., Dover, for an exhibit of Asters and other herbaceous plants.

To Mr. E. B. Le Grice, North Walsham, for an exhibit of Roses.

To Messrs. E. C. Simmonds & Son, St. Albans, for an exhibit of Asters and other herbaceous plants.

Selected for trial at Wisley

Tradescantia 'Kreiser,' and T. 'Valour,' from Messrs. M. Prichard & Sons, Ltd., Christchurch.

Other Exhibits

Fuchsia 'Rose of Castile Improved' and *F. triphylla* 'Thalia,' from C. J. Howlett, Esq., Earley, Reading.

Rose 'Tapis Rose,' from Messrs. Wheatcroft, Ruddington.

Roses from Messrs. G. Longley & Sons, Rainham.

Roses and Violas, from Mr. C. A. Jardine, Feltham.

Salvia splendens 'Wisley tetraploid,' from the Director, R.H.S. Gardens, Wisley.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and seventeen other members present.

Awards Recommended:*Silver Flora Medal*

To Messrs. Hillier & Sons, Winchester, for an exhibit of flowering and berried shrubs.

To Mr. F. Street, Woking, for an exhibit of flowering shrubs and conifers.

To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of flowering and berried shrubs.

Silver Banksian Medal

To Messrs. J. Cheal & Son, Ltd., Crawley, for an exhibit of flowering and berried shrubs.

Flora Medal

To Messrs. Robinson, Eltham, for an exhibit of rock garden plants.

Banksian Medal

To Hollybush Nurseries, Harpenden, for an exhibit of rock garden plants.

To Kew Topiary Nursery, Richmond, for an exhibit of clipped box and bay trees.

To Winkfield Manor Nurseries, Ascot, for an exhibit of rock garden plants.

Award of Merit

To *Rosa rubrifolia* as an ornamental-fruited shrub (votes unanimous), from A. T. Johnson, Esq., Bulkeley Mill, Tyn-y-Groes, Conway, N. Wales.

The Committee desired to see the following in flower:

Rosa Moyesii × *macrophylla*, *Rosa Moyesii* 'Geranium,' both exhibited by A. T. Johnson, Esq.

Other Exhibits

Abelia chinensis, exhibited by Messrs. Hillier & Sons, Winchester.

Eucalyptus Gunnii whittinghamensis, exhibited by Capt. Collingwood Ingram, Benenden, Kent.

Hibiscus syriacus 'Woodbridge,' exhibited by Messrs. R. C. Notcutt, Ltd., Woodbridge.

Nymphaea gigantea, exhibited by Hon. Mrs. G. Lane, Oundle, Northants.

Schima argentea, *S. khasiana*, exhibited by Col. E. H. W. Bolitto, D.S.O., Trengwainton, Penzance.

ORCHID COMMITTEE—MR. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and eleven other members present.

Award Recommended:*Silver Banksian Medal*

To Messrs. Sanders, St. Albans, for a group of Orchids.

JOINT DAHLIA COMMITTEE—Mr. E. CHEAL in the Chair, and eight other members present.

Selected for trial at Wisley

'Axford Triumph,' 'Blushes,' 'Lindy,' from A. T. Barnes, Esq., Bedford.
 'Kathie Haas,' from Messrs. E. Cooper & Son, St. Albans.
 'Eastwood Glory,' from G. F. Drayson, Esq., Buckhurst Hill.
 'Dockenfield,' and another variety subject to renaming from Mr. Owen Parratt, Farnham, Surrey.
 'Jeff Cooper,' 'John Shores,' 'Peggy Mathams,' 'Ulva Quarrall,' 'Wendy Jill,' and another variety subject to renaming from Messrs. J. F. Spencer & Son, Hockley.
 'David Hartley,' 'Tintern,' and another variety subject to renaming, from Messrs. J. Stredwick & Son, St. Leonards-on-Sea.

To be seen again

'Rosedew,' from A. T. Barnes, Esq., Bedford.
 'Violet Hope,' from Messrs. J. Stredwick & Son, St. Leonards-on-Sea.
 Unnamed seedling, from Messrs. A. MacGregor, Harpenden.

JOINT EARLY FLOWERING CHRYSANTHEMUM COMMITTEE—Mr. E. F. HAWES in the Chair, and ten other members present.

Awards Recommended:

Award of Merit

To 'Prefect,' as an exhibition variety (votes 7 for, 0 against), shown by Mr. W. B. Jackson, Brown Heath Nursery, Waverton, Chester.
 To 'Red Flare' (votes 9 for, 0 against), 'Tibshelf Delight' (votes 7 for, 1 against), 'Orange Torch' (votes 9 for, 0 against) and 'Bravado' (votes 6 for, 3 against), all as exhibition varieties, shown by Messrs. J. & T. Johnson, Tibshelf, Derbys.
 To 'Steadfast' (votes 7 for, 2 against) and 'Prince' (votes 8 for, 0 against), both as exhibition varieties, shown by Colham Green Nurseries, Ltd., Chapel Lane, Hillingdon, Middlx.

Selected for trial at Wisley

'Prefect,' shown by Mr. W. B. Jackson, Brown Heath Nursery, Waverton, Chester.
 'Red Flare,' 'Tibshelf Delight,' 'Orange Torch' and 'Bravado,' shown by Messrs. J. & T. Johnson, Tibshelf, Derbyshire.
 'Doris,' shown by Colham Green Nurseries, Chapel Lane, Hillingdon, Middlesex.

Other Exhibits

'Julie' (to be seen again) and 'Carlotta,' shown by Mr. J. W. Cooper, Dean Road, Rhosnessney, Wrexham.
 'Royal Orange,' 'Royal Supreme,' sports from 'Royal Bronze,' and 'Crimson Bronze Barbara,' shown by Mr. F. Rowe, Rylands Nurseries, Sampford Arundel, Wellington, Somerset.
 'Reverie' and 'Yellow Monsal Head' (to be seen again), shown by Messrs. J. & T. Johnson, Tibshelf, Derbyshire.
 'Conqueror,' from Mr. N. E. Gammon, Mayflower Cottage, Broadham Green, Oxted, Surrey.
 'Yellow Sands' and 'Rufus' (to be renamed), from Mr. John R. Bell, Richmond Nursery, Cross-in-Hand, Sussex.
 'Yellow Crossley,' from Mr. S. H. Rogers, Syston Hill, Warmley, Bristol.

SEPTEMBER 27, 1949

JOINT EARLY FLOWERING CHRYSANTHEMUM COMMITTEE—Mr. G. W. LEAK, V.M.H., in the Chair, and twelve other members present.

Awards Recommended:

Award of Merit

'Dorothy Wearing' and 'Gloaming' (votes 12 for, 0 against in each case) both as exhibition varieties, shown by Messrs. H. Shoesmith, Ltd., Mayford Nurseries, Woking, Surrey.
 'Rosevern' (votes 11 for, 0 against), 'Ladylike' (votes 8 for, 2 against), and 'Merrydue' (votes 11 for, 0 against), all as exhibition varieties, shown by Messrs. J. & T. Johnson, Tibshelf, Derbyshire.

Selected for trial at Wisley

'Joan,' 'Royal Daffodil,' 'Vampire,' 'Adoration,' and 'Gloaming,' from Messrs. H. Shoesmith, Ltd., Mayford Nurseries, Woking, Surrey.
 'Rosevern,' 'Ladylike,' 'Salmon Daydream,' and 'Merrydue,' from Messrs. J. & T. Johnson, Tibshelf, Derbyshire.

Other Exhibits

'J. W. Randall,' 'Attractive,' 'Muriel,' 'Yellow Star,' 'Viscount,' 'Frances Drake,' and 'Dainty,' all from Messrs. H. Shoesmith, Ltd., Woking, Surrey.
 'Elysia' and 'Golden Valley' (to be seen again), from Messrs. J. & T. Johnson, Tibshelf, Derbyshire.
 'Godfrey Baseley' and 'Market Crimson,' from Messrs. H. Woolman, Ltd., Shirley, Birmingham.
 'Bryan Alway' (to be seen again), from I. Alway, Esq., Bitton, Bristol.

OCTOBER 4, 1949

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and nine other members present.

White fruited Elder.—The Secretary showed on behalf of Mr. A. D. Blaxill, of Colchester, who had collected it growing wild in Suffolk, a fruiting shoot of the white-fruited Elder, *Sambucus nigra* var. *alba*. This form has long been known though it is uncommon.

Dwarf Elm.—He also showed a piece of elm found in Hertfordshire and transplanted into a garden there about fifteen years ago, which had now attained a height of only about 18 inches. The species was in doubt but the leaves which were strongly toothed, were about $\frac{1}{2}$ inch long, ovate-lanceolate and closely set.

Hosta species.—Dr. N. Hylander, who has made a special study of the many forms of *Hosta* growing in Swedish gardens, where they appear to flourish, showed a large number of beautiful photographs illustrating their habit, foliage and flower, and gave his conclusions regarding their nomenclature. The Committee greatly appreciated the exhibition and expressed the hope that Dr. Hylander would soon be able to publish an illustrated account of the genus which contains a large number of forms, some of which have apparently not been named. Mr. W. T. Stearn showed living material of those he identified as *H. lancifolia*, *H. tardifolia*, a late flowering form with firm leaves, figured as a variety of *H. lancifolia* in Bot. Mag. 8645, *H. crispula*; and a form with white margined leaves, *H. albo-marginata* (Bot. Mag. 3657).

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRETT, C.B.E., F.L.S., V.M.H., in the Chair, and thirty-two other members present.

Exhibits**Awards Recommended:***Gold Medal*

To Messrs. Sutton & Sons, Ltd., Reading, Berks., for a group of Mixed Vegetables (votes 22 for, 1 against).

To Messrs. T. Rivers & Sons, Ltd., Sawbridgeworth, Herts., for a group of Mixed Fruit (votes 21 for, 2 against).

Silver-gilt Hogg Medal

To the Principal of Hertfordshire Institute of Agriculture, Oaklands, St. Albans, for a group of Apples and Pears.

Silver Hogg Medal

To Messrs. J. Cheal & Sons, Ltd., Lowfield Nurseries, Crawley, Sussex, for a group of Apples and Pears

To the Viticultural Research Station, Oxted, Surrey, for a group of Grape Varieties.

To the Governors of Banstead Hall Schools, Banstead, Surrey, for a group of Apples and Pears.

Hogg Medal

To the Winkfield Manor Nurseries, Ascot, Berks., for a group of Mixed Fruit.

Other Exhibits

Apple 'Howgate Wonder,' from the National Fruit Trials, Wisley.

Apple Seedling, from R. O. C. Storey, Esq., 32 Halsbury Road East, Northolt Park, Middlesex.

Apple Seedling, from G. T. Malthouse, Esq., Brown Heath, Ellesmere, Shropshire.
 Apple 'Mary Hamilton,' from Miss Mary Hamilton, Sunhoney, Milltimber, Aberdeen.
 Apples 'New Hybrid No. 21' and 'New Hybrid No. 23,' from N. W. Barratt, Esq., Ince Orchards, nr. Chester.
 Nut 'Knight's Filbert Seedling' and Crab Apple 'Horsted Crab,' from Miss A. Knight, 30 Dagmar Road, Chatham, Kent.
 Apple 'Clifford Harding,' from Mrs. E. Atkins, 1 Tennyson Road, Coventry.
 Apple Seedlings (2), from P. Johnson, Esq., 17 Rutherwyke Close, Stoneleigh, Surrey.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:

Gold Medal

To Messrs. Napier, Ltd., Taunton, for an exhibit of Chrysanthemums.

Silver-gilt Flora Medal

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Begonias.
 To Mr. Stuart Ogg, Swanley, for an exhibit of Dahlias.
 To Messrs. A. G. Vinten, Ltd., Balcombe, for an exhibit of Chrysanthemums.

Silver-gilt Banksian Medal

To Mr. John R. Bell, Horam, for an exhibit of Chrysanthemums.
 To Messrs. W. Wood & Son, Ltd., Taplow, for an exhibit of Asters.
 To Messrs. H. Woolman, Ltd., Birmingham, for an exhibit of Chrysanthemums.

Silver Flora Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations and other Dianthus.
 To Messrs. Bakers Nurseries, Ltd., Wolverhampton, for an exhibit of herbaceous plants
 To Messrs. Brown & Such, Ltd., Maidenhead, for an exhibit of Dahlias.
 To Messrs. T. Carlile, Ltd., Twyford, for an exhibit of Asters.
 To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of Dahlias.
 To Messrs. W. Lowe & Son, Beeston, for an exhibit of Roses.
 To Messrs. J. F. Spencer & Son, Ltd., Hockley, for an exhibit of Dahlias.
 To Messrs. W. Wood & Son, Ltd., Taplow, for an exhibit of Dahlias.

Silver Banksian Medal

To Mr. A. E. Cocks, Hockley, for an exhibit of Dahlias.
 To Messrs. Greenyer Bros., Ltd., Woking, for an exhibit of Chrysanthemums.
 To Messrs. Keith Luxford & Co., Sawbridgeworth, for an exhibit of Chrysanthemums.
 To Mr. A. Miles, Bickley, for an exhibit of Asters and other herbaceous plants.
 To Messrs G. & R. Perry, Enfield, for an exhibit of Asters, Chrysanthemums and *Catanache coerulea major*.
 To Messrs. Ryder & Son (1920), Ltd., St. Albans, for an exhibit of Dahlias.

Flora Medal

To Messrs. Hale & May, Ltd., Cookham, for an exhibit of herbaceous plants.
 To Mr. L. S. Harbutt, Wickhambrook, for an exhibit of Asters and other herbaceous plants.
 To Home Meadows Nursery, Martlesham, for an exhibit of Dahlias.
 To Messrs. G. F. Letts & Sons, Hadleigh, for an exhibit of Roses.
 To Messrs. M. Pritchard & Sons, Ltd., Christchurch, for an exhibit of Asters and other herbaceous plants.
 To Messrs. Wheatcroft Bros., Ltd., Ruddington, for an exhibit of Roses.

Banksian Medal

To Messrs G. & A. Clark, Ltd., Dover, for an exhibit of herbaceous plants.
 To Mr. E. B. Le Grice, North Walsham, for an exhibit of Roses.
 To Orpington Nurseries Co., Ltd., Orpington, for an exhibit of Korean Chrysanthemums.
 To Messrs. Sale & Son (Wokingham), Ltd., Wokingham, for an exhibit of Asters, Dahlias, etc.
 To Messrs. E. C. Simmonds & Son, St. Albans, for an exhibit of Asters and Chrysanthemums.

Award of Merit

To Chrysanthemum 'William Greenyer' as a variety for exhibition (votes 14 for, 1 against), from Messrs. Greenyer Bros., Ltd., Broadwater Green Nurseries, Worthing.

Selected for trial at Wisley

Chrysanthemum 'Amber Daydream,' from Mr. G. H. Boot, Wollaton, Notts.
 Chrysanthemums 'Brabazon' and 'Cresset,' from Messrs. Napier, Ltd., Taunton.
 Chrysanthemum 'William Greenyer,' from Messrs. Greenyer Bros., Ltd., Worthing.
 Chrysanthemum 'Sunbrite,' from Mr. R. Thistlethwaite, Hatfield.

Other Exhibits

Asters 'Coventry Pink' and 'Coventry Purple,' from Mr. E. Hoad, Coventry.
 Chrysanthemum 'John Wearing,' from Mr. E. D. Fincken, Rudgwick.
 Chrysanthemum 'Margaret Clarke,' from Mr. J. R. Bell, Horam.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and nineteen other members present.

Silver-gilt Banksian Medal

To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of berried and ornamental-foliaged shrubs, and herbaceous flowers.

Silver Flora Medal

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of berried and ornamental-foliaged trees and shrubs.
 To Messrs. Hillier & Sons, Winchester, for an exhibit of berried and ornamental-foliaged trees and shrubs.
 To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of flowering and ornamental-foliaged trees and shrubs.

Silver Banksian Medal

To Messrs. R. C. Notcutt, Ltd., Woodbridge, for an exhibit of flowering and berried shrubs.
 To Mr. F. Street, Woking, for an exhibit of Heaths and ornamental-foliaged shrubs.

Flora Medal

To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of berried and ornamental-foliaged trees and shrubs.
 To Winkfield Manor Nurseries, Ascot, for an exhibit of rock garden plants and Asters.

Banksian Medal

To Kew Topiary Nurseries, Richmond, for an exhibit of clipped box and bay trees.
 To Messrs. Robinson, Eltham, for an exhibit of rock garden plants.

Award of Merit

To *Pinus Montezumae* Glaucon Form, as an evergreen tree suitable for the milder districts of the British Isles (votes unanimous), from G. H. Dowty, Esq., Grayswood Hill, Haslemere.
 To *Worsleya procera* (syn. *Hippeastrum procerum*) as a flowering plant for the greenhouse (votes unanimous), from Major A. Pam, O.B.E., M.A., F.L.S., V.M.H., Wormley Bury, Broxbourne, Herts.

Preliminary Commendation

To *Acer platanoides* 'Goldsworth Purple' as a hardy, ornamental-foliaged tree (votes unanimous, subject to verification of name), from Messrs. L. R. Russell, Ltd., Windlesham.

Other Exhibits

Ampelopsis brevipedunculata var. *Maximowiczii*, exhibited by the Director, Royal Botanic Gardens, Kew.
Carex scaposa, exhibited by G. H. Dowty, Esq., Grayswood Hill, Haslemere, Surrey.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and thirteen other members present.

Award Recommended:**Silver Flora Medal**

To Messrs. Sanders, St. Albans, for a group of Orchids.

JOINT DAHLIA COMMITTEE—Mr. G. MONRO, C.B.E., V.M.H., in the Chair, and eleven other members present.

Selected for trial at Wisley

'Pink Nymph,' from A. T. Barnes, Esq., Bedford.

'Icterus,' from Messrs. A. MacGregor, Hollybush Nurseries, Harpenden.

'Bordon,' 'Firgrove,' 'Jo. Wakeford,' from Mr. Owen Parratt, Boundstone Nursery, nr. Farnham.

'Amalgam,' 'Jessie Lane,' from Messrs. J. F. Spencer & Son, Ltd., Hockley, Essex.

'Ester Burt,' 'Heathfield,' 'Iden,' 'Medway,' 'Northiam,' 'Sheila Leslie,' from Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea.

A Dahlia was also submitted by Mr. L. van den Bogact, Linkebeek, Belgium.

JOINT ROCK GARDEN PLANT COMMITTEE—Mr. W. BENTLEY in the Chair, and eight other members present.

Award Recommended:

Award of Merit

To *Cyclamen cyprium* as a hardy flowering plant for the Alpine House, from M. Ogilvie-Grant, Esq., 71, Kew Green, Kew, Surrey.

OCTOBER 18, 1949

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and five other members present.

Erinose on Vines.—Mr. G. Fox Wilson showed leaves of outdoor vines picked at Cranleigh in June with patches of coarse hair on the lower surface causing erinose, which was at one time thought to be a fungus growth but which is now known to be due to the attack of a mite, identified by Dr. A. M. Massee as *Phytoptus vitis*. As he remarks, it is of uncommon occurrence on outdoor vines. It can be kept in check by spraying during the dormant season with lime-sulphur.

Crocuses.—Mr. Bowles reported that a white form of *Crocus Kotschyanus* (*C. zonatus*) had occurred this year in his garden at Myddelton House and that Mr. Trotter and he had found in Mr. Trotter's garden at Leith Vale a *Crocus*, growing among other autumn flowering *Crocuses* which may be hybrids between *C. Salzmanni* and *C. speciosus*, showing characters in corm tunic as well as in flowers intermediate between those species.

Allium tuberosum.—Mr. Stearn showed a plant of *Allium tuberosum* still in flower from his garden, where it had been flowering for the long period, abnormal among *Alliums*, from July to the present time.

Nerine filifolia.—A finely flowered pot of *Nerine filifolia*, shown by Col. Clarke, M.P., of Borde Hill, Sussex, was referred to the Committee from Floral Committee B. It agreed well in all characters with the original description and plate of the species in *Bot. Mag.* 6547. A form with somewhat smaller flowers and rather apt to produce few of them is often seen in gardens and has been called var. *pauciflora*.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and nine other members present.

Awards Recommended:

Silver Flora Medal

To Messrs. Stuart Low & Co., Jarvis Brook, for a group of Orchids.

Silver Banksian Medal

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

Award of Merit

Laeliocattleya 'Resolute' var. 'Dauntless' (*Lc.* 'Aphrodite' × *Lc.* 'Mrs. Willoughby Pemberton') (votes 9 for, 0 against), from H. W. B. Schroder, Esq., Dell Park, Englefield Green, Surrey.

Cattleya 'Bow Bells' var. 'Snowdrop' (*C. Edithiae* × *C.* 'Suzanne Hye') (votes 8 for, 0 against), from Mr. Clint McDade, Signal Mountain, Tennessee, U.S.A.

Brassolaeliocattleya 'Midnette' (*Blc.* 'Zante' × *Lc.* 'Mrs. Medo') (votes 8 for, 0 against), from Messrs. Charlesworth & Co., Haywards Heath.

Preliminary Commendation

Odontonia 'Mandania' (*Odontonia* 'Mandelia' × *Odontoglossum* 'Ascania') (votes 8 for, 0 against), from Messrs. Charlesworth & Co., Haywards Heath.



REPORT OF THE COUNCIL OF
THE ROYAL HORTICULTURAL SOCIETY
TO THE
ONE HUNDRED AND FORTY-SIXTH
ANNUAL GENERAL MEETING OF THE SOCIETY
TO BE HELD IN THE LECTURE ROOM OF ITS NEW HALL,
GREYCOAT STREET, WESTMINSTER
AT 3 P.M. ON TUESDAY, FEBRUARY 14, 1950

REPORT OF THE COUNCIL OF THE ROYAL HORTICULTURAL SOCIETY

THE Society's Fellowship still shows a welcome increase in numbers.

The process of redecoration of the Society's premises at Vincent Square has been continued, and, although there is still a certain amount of work to be done, the buildings have both now progressed well towards a satisfactory state of decoration. Much more work has also been done in bringing the glasshouses at Wisley into a good state of preservation and the Gardens have also been extended in area to provide a better situation for the planting of the Society's collection of fruit trees.

Numerical Strength—The position of the Fellowship on December 31, 1949 was as follows:—

LOSS BY DEATH IN 1949			ELECTIONS IN 1949		
Honorary Fellows	..	1	Associates of Honour	..	3
Associates of Honour	..	6	Life Fellows	..	10
Life Fellows	..	30	4 Guinea Fellows	..	188
4 Guinea Fellows	..	9	3 Guinea Fellows	..	1836
3 Guinea Fellows	..	132	2 Guinea Fellows	..	2559
2 Guinea Fellows	..	223	Overseas Fellows	..	236
Overseas Fellows	..	1	Associates	..	292
Associates	..	2	Affiliated Societies	..	239
		404			5363
LOSS BY RESIGNATION			ADMISSIONS IN 1949		
4 Guinea Fellows	..	56	Student Members	..	14
3 Guinea Fellows	..	486			
2 Guinea Fellows	..	1219	SUMMARY FOR 1949		
Overseas Fellows	..	27	Elections and Admissions		5377
Associates	..	64	Resignations and Deaths		2324
Affiliated Societies	..	40			
Student Members	..	28	Net Increase	..	3053
		1920	Fellows	..	33,821
			Associates	..	1,073
			Societies	..	1,363
			Student Members	..	11
Total strength on					
November 2, 1948	..	33,215			
Total strength on					
December 31, 1949	..	36,268			36,268

Obituary—The Society has suffered many serious losses by death since the last report. Four Vice-Presidents of the Society have died. They are Mr. C. T. Musgrave, V.M.H., who was for many years on the Council of the Society and was Treasurer for the years 1922–24, 1928–1929, 1932–33; the Society owes him a great debt of gratitude for his wise counsel during his very many years of office; Sir Frederick Moore,

M.A., D.Sc., F.L.S., V.M.H., was the last surviving original member of the holders of the Victoria Medal of Honour and was one of the outstanding figures in horticulture both in this country and in Ireland; Mr. Alistair Clark, who represented the Dominion of Australia, was well known as a raiser of Daffodils and Roses, and held a very high position in horticulture in his country; and Viscount Ullswater, G.C.B., P.C., a very keen gardener, who was also well known to the public as a former Speaker of the House of Commons.

The Council also records with regret the death of the following holders of the V.M.H.: Mr. R. Bolton, well known for his work with Sweet Peas and a great lover of Ferns; Mr. Alex. Dickson, the Rose grower; and Mr. W. R. Oldham, an ex-member of Council and a prominent figure in the horticultural trade; and also the death of the following Associates of Honour: Mr. T. W. Anderson, Mr. A. R. Harrison, Mr. H. F. Macmillan, Mr. J. W. Matthews, and Mr. W. H. Page.

Among other notable horticulturists who have passed away are Professor John Percival, M.A., D.Sc., a member for many years of our Scientific Committee; Mr. C. E. Radcliff, of Hobart, Tasmania, a noteworthy breeder of Daffodils, especially pink-cupped varieties; Mr. E. F. Stead, of New Zealand, who was well known to enthusiasts of Rhododendron and other plants in this country; the Viscountess Byng of Vimy, an authority on alpine plants; Mr. C. A. Nethercote, of Hawthorn, Victoria, Australia, a veteran Daffodil enthusiast; Mr. G. H. Burt, well known as a veteran Sweet Pea raiser; Mr. Murray Hornibrook, the great authority on dwarf conifers; Mr. F. S. Harvey Cant, the well-known rosarian; Mr. G. P. Harben, a keen amateur orchid grower; and Mr. J. J. Campbell, who was Assistant Curator at the Royal Botanic Garden, Edinburgh.

The Horticultural Trades Association has presented the Society with two Oak seats to be erected in our Gardens at Wisley as a memorial to Mr. Oldham.

Shows—The Fortnightly Shows have been bigger than in the other years since the war and have been well attended, and the quality and the brilliance of the displays has been of a high order.

The total attendance at the Shows in the Halls during the year marks an increase of more than 8,530 over the previous year. The Chelsea Show this year was larger than in either of the two years since the war and the size of the tents was increased, reaching as great an area as in the pre-war Shows. The quality of the exhibits was high and the Show was very successful, although slightly marred by rain on one day. A considerable amount of money has been expended on drainage and the Council intends to spend more during the winter, still further to improve the conditions under foot.

Owing to his indisposition, His Majesty the King was not able to visit the Show, but Her Majesty the Queen graciously honoured the Society with a visit, as did other members of the Royal Family.

The attendance both of Fellows and the public at Chelsea was greater than in 1948, but this was partly due to the fact that the Show extended over four days, the first day being a Private View restricted to Fellows and Associates only. The Council noted with satisfaction that

the re-introduction of the Private View was successful in reducing the crowded conditions which had been in evidence in the previous Shows.

The arrangements for the turnstiles and the exits were also improved to enable visitors to the Show to enter and to leave with greater ease than in previous years. The Council is well aware of the fact that the tents are still somewhat crowded at the popular hours and have the position constantly under review with the view of making a visit to the Show as pleasant as possible.

The Horticultural Machinery Show was held on March 29 and 30, in the Old Hall, and was followed by a Demonstration of Mechanical Appliances for use in Horticulture at Wisley on April 20 and 21, 1949. Sixty-four firms demonstrated various appliances and the National Institute of Agricultural Engineering, Wrest Park, Silsoe, Beds., staged an exhibit of recent developments in horticultural machinery. The Demonstration was on similar lines to that which was so successful in 1947 and was well attended by members of the public.

The Daffodil Competition, provided primarily for West-Country growers, was one of the most successful which has been held, and at the Daffodil Show the entries were more numerous than in any year since 1939. The Rhododendron Show, held in conjunction with the Rhododendron Conference, completely filled the Old Hall, and the competition was the keenest since the war. The enlarged schedule for the Gladiolus Competition produced nearly twice as many entries as that for 1948. In spite of the widespread and prolonged drought the quality of the vegetables at the Autumn Fruit and Vegetable Show was good. The number of entries for the fruit classes was greater than at any Show since 1937, and although the specimens of cooking varieties were smaller than usual, the quality throughout was high.

The Gardens—The year at Wisley was made especially notable by a gracious visit from Their Majesties The King and Queen on Wednesday, May 11.

As in other gardens, the exceptionally dry summer and autumn have created difficult problems at Wisley, but with the help of the greatly improved irrigation system, recently installed, and drawing an abundant water supply from the river, these difficulties; on the whole, have been successfully overcome and very little permanent damage has been done. On Battleston Hill, for example, where many recent plantings have been made in the light, sandy soil, no plants have been lost. In addition to the drought, the year was marked by a very severe frost on May 9 which, in the lower-lying parts of the Gardens, did considerable damage to young growth and to flowers, the display in the old Azalea Garden being completely spoilt.

Battleston Hill continues to be one of the main centres of development at Wisley, the plantings of Camellias, Azaleas, Rhododendrons, Magnolias and other woodland plants having been considerably extended; many Lilies are also being raised for this area of the Gardens.

A commencement has been made in the reorganization of the Rock Garden, one section having already been completed, the old soil replaced by new, and recently propagated alpinists planted in effective groups.

In the Wild Garden many hundreds of Primulas and Meconopsis,

raised at Wisley, have been planted out, and the display next May and June should be outstanding.

The first cropping of the two small unheated glasshouses presented by Messrs. Richardsons of Darlington, and erected for demonstration purposes, has attracted many visitors seeking guidance for their own gardens.

The National Species collections of Chrysanthemums and Dahlias have been increased; it is hoped to obtain further wild-collected seed of Dahlias from Central America as it is evident that, owing to hybridization, there are few, if any, pure species now in cultivation.

The replanting of the Stove House, which was used during the war for the breeding of the White Fly Parasite, has continued, greatly helped by gifts of plants from the Royal Botanic Gardens, Kew, The Chelsea Physic Garden, and elsewhere.

A number of collections of seeds and plants from overseas expeditions has been raised during the year, notably from Mr. V. H. Heywood and Mr. P. Davis (Spain, 1948), Mr. F. Ludlow and Major G. Sheriff (Bhutan, 1949), Professor R. H. Compton (Basutoland, 1949), Mr. T. G. Y. Porter (Corsica, 1949), Dr. J. F. Rock (S.W. China, 1948—received through the kindness of Mr. G. Grace, Secretary of the American Rhododendron Society) and Mr. O. Polunin (Nepal, 1949). In addition there have been many valuable gifts of plants and seeds during the year, including a fine collection of orchids from the British Orchid Growers' Association, further Camellias from Mr. Clint McDade of Chattanooga, Tennessee, and Mr. W. G. Hazlewood, New South Wales, Rhododendrons from Mr. J. B. Stevenson, of Tower Court, Ascot, and a large collection of seeds for the Annual Border from Messrs. Sutton & Sons and Messrs. Watkins and Simpson. The Council wishes to express its thanks for these and many other generous donations, both for the Gardens and for distribution to Fellows.

Fruit—The three Model Fruit Gardens which were planted two years ago on the hill adjoining the weather station have now become well established and full crops were picked from the soft fruit units this year, while a light crop of pears was also obtained. The gardens have been inspected by many visitors and a large number of inquiries has been received regarding the training of the various forms of trees.

It will be remembered that the Government, who share with us the cost of the fruit trials, have decided to set up a fruit trial station of their own near Mereworth, where the trees would be less subject to spring frosts than they are in the low-lying piece of ground at Wisley where they are at present planted.

The transference will be a gradual process taking some ten years to complete. Meanwhile, the Society, in order to preserve a collection of the more interesting fruits for the benefit of Fellows, has purchased some higher land adjoining the Wisley Gardens, where a large collection is being planted.

The Council would like to record their thanks to Mr. J. M. S. Potter, the Officer in charge of the National Fruit Trials, for the help and advice he has given to the Society's Fruit Officer in connexion with both the Model Gardens and the development of the new fruit collection.

National Fruit Trials—The trials of hardy fruits for commercial and private purposes have again increased, and approximately 50 acres of orchards now exist. These are open to the inspection of all interested in fruit growing. Since the inception of the trials, over 600 varieties have been accepted for testing in comparison with the standard varieties. A standard collection of each kind of fruit is also maintained and these collections have proved invaluable for purposes of synonymy, identification, etc. Results of many of the trials, which are continuous, have been published, and these have been of considerable value to the potential grower of new varieties. The recording of the vegetative characters of all kinds of fruit has been continued and data for the purposes of nomenclature is being gradually accumulated. A severe frost on the night of May 9–10 unfortunately did much damage to this year's crop, especially of Apples, Pears and Plums.

Advisory Work—There has been a considerable increase in the number of inquiries relating to pests and diseases, to general cultivation, weed destruction and the identification of plants. About one-half of the inquiries related to ornamental plants.

War Memorial at Wisley—A memorial tablet to members of the staff and students at Wisley who lost their lives in the Second World War was unveiled in the Laboratory by the President of the Society, Lord Aberconway, on Monday, October 17, 1949, in the presence of relatives of the fallen together with members of the Wisley Advisory Committee, and past and present staff, students and trainees at the Gardens.

Floral and Vegetable Trials—Trials of the following plants have been carried out during the year: Perennial Asters, Border Carnations, Early-flowering and Korean Chrysanthemums, Dahlias, Delphiniums, Gladioli, Bearded and Dutch Irises, Perennial Lupins, Narcissi, Garden Pinks, Rhododendron hybrids, hybrids of *Tulipa Kaufmanniana*, Perennial Scabious, and Solidagos. The following Annuals were tried: Antirrhinums, Godetias, Nasturtiums, Pansies and varieties of *Primula obconica*.

The Invited Vegetable Trials have included Asparagus, Dwarf, French and Runner Beans, Beetroot, Ridge Cucumbers, Parsley and Rhubarb.

Besides these, the Society has again undertaken, at the request and at the expense of the Ministry of Agriculture, a large series of field trials of vegetables from seed imported by the Seeds Import Board. The Council again desires to record its special thanks to Messrs. J. S. Cracknell, V.M.H., W. F. Giles, V.M.H., F. G. Potter, and N. L. Tether, who acted as judges and advisers at these trials. The trials will be undertaken again during 1950 on behalf of the Seeds Import Board.

School of Horticulture—The training of Student-gardeners, and of ex-Service men under the Ministry of Agriculture's Vocational Training Scheme, has continued; 6 students completed their two-year course in October, and 30 trainees their one-year courses in April and October. Of these 36 men, 31 gained the Wisley Diploma. At the close of the year there were 17 students and 26 trainees at Wisley.

Scientific Investigations—The Entomological Department has been concerned with investigations on the effects of organic compounds (BHC, DDT, HETP, TEPP, E605, etc.), as sprays, dusts or fumigants, upon a range of horticultural plants. Comparative trials were carried out with certain insecticides against Cabbage Root Fly. The effect of some Systemic Insecticides upon the incidence of plant pests were also investigated. The relationship between Carrot Fly and Parsnip Canker was investigated in co-operation with the Mycological Department.

In the Mycological Department the development of Antirrhinum stocks resistant to rust diseases has been continued, with promising results. Work on Parsnip Canker has occupied the largest proportion of the time available for research and a first report has been sent to the Horticultural Group of the Agricultural Improvement Council. Some observations on resistance to Mildew have been made on the Onion varieties grown in the Trial Grounds during the past two years.

In the Cytological Department the treatment of various plants, including annuals and shrubs, with colchicine for the production of improved varieties has continued, together with the cytological investigation of a number of genera of garden plants, notably *Magnolia*, *Rhododendron*, *Narcissus*, *Kniphofia*, *Primula*, *Asparagus*, *Nerine*, *Philadelphus* and *Hydrangea*.

Garden Advisory Service—During 1949 requests for the services of the Garden Adviser have continued to be numerous, and the demand has again been met with the assistance of the Panel of Garden Advisers.

The advice sought covers all forms of gardening, but there is a definite trend for information as to the best methods of running a garden on labour-saving lines in order to meet the present-day labour problems.

The Groups—The Fruit, Lily and Rhododendron Groups have been active:

The Fruit Group—The Fruit Group held two discussions and a "Brains Trust." On September 3 about 150 members spent the afternoon at the East Malling Research Station, near Maidstone. At most Fortnightly Shows throughout the year members of the Group exhibited dishes of fruit.

The Lily Group—The Lily Group held three meetings, two of which were used for discussions and the third for a Lily "Brains Trust." On July 2 a party of members visited the gardens of Lieut.-Colonel L. C. R. Messel, at Nymans, Handcross, and Col. F. C. Stern, at Highdown, Goring-by-Sea. At the Fortnightly Show on July 12 the members of the Group provided a very comprehensive co-operative display of Lilies.

The Rhododendron Group—The activities of this Group were concentrated in the period around the Rhododendron Conference, which was held on April 26 and 27. The papers and details of the discussions at the Conference have been printed in the *Rhododendron Year Book*. A tour of Rhododendron Gardens in Cornwall and the West Country, including a visit to the President's Garden at Bodnant, was arranged. Sixty-six persons, including several visitors from the United States of America, took part in the tour which was a great success. Visits were also made to the Gardens of J. B. Stevenson, Esq., Tower Court, Ascot,

Berks., Sir Giles Loder, Bt., Leonardslee, Horsham, Sussex, Sir Henry Price, Wakehurst Place, Ardingly, Sussex, and the Society's Gardens at Wisley.

The Lindley Library—During the year over 280 books and major pamphlets, as well as back and current parts of periodicals, have been added to the Lindley Library. Accessions include—

Curtis's Botanical Magazine, vols. 1-146 (1787-1920), the unique Hooker large-paper set, of which vols. 54-130 (1827-1904), comprising the New series and Third Series, are in quarto :

Hunger, F. W. T., *The Herbal Pseudo-Apuleius* (1935);

Luther Burbank Society, *Luther Burbank, his Methods and Discoveries* (1914-15), presented by Mr. H. Walkden;

Plues, M., *Coloured Drawings of Swiss Plants* (c. 1850), unpublished, presented by Mr. V. G. Mellin;

Rehder, A., *Bibliography of cultivated Trees and Shrubs* (1949);

Royal Geographical Society, *Journal*, vols. 23-50 (1853-80), *Proceedings*, vols. 1-22 (1855-78), and *Geographical Journal*, vols. 1-111 (1893-1948), presented by the Royal Agricultural Society;

Warner, M. F., *Early horticultural Literature, a Check-list of 16th, 17th and 18th Century horticultural Works*, unpublished typescript, presented by the United States Department of Agriculture through the courtesy of Miss M. F. Warner.

Two large glass-fronted cases for folio works have been installed.

The Regulations of the Library have been revised and printed. 1,920 books have been lent to Fellows.

Publications—The JOURNAL has been published regularly and owing to an easing of the paper situation it has been possible to make a slight increase this year in its size after providing for the increased number of copies necessitated by the increased Fellowship of the Society.

Work is proceeding on books dealing with the following plants: Anemones, by Messrs. E. A. Bowles and W. T. Stearn; Snowdrops and Snowflakes, by Mr. E. A. Bowles and Colonel F. C. Stern; and Chinese Magnolias in Cultivation, by Mr. G. H. Johnstone. It is hoped that the two latter volumes may be ready to send to the printers during the early part of 1950 and be published during the year.

A complete volume of the New series of the *Botanical Magazine* has been produced. The plates were printed in colour gravure and the volume was dedicated to the President of the Society, Lord Aberconway, C.B.E., LL.D., V.M.H. The plates have been prepared for the 1950 volume, and it is hoped that during this year more Fellows will become subscribers.

The *Index to the Botanical Magazine* from its commencement in 1787 to 1947 is now with the printers, and it is hoped that this work, which has been prepared by Mr. F. J. Chittenden, may be published early in 1950.

The *Daffodil and Tulip, Fruit, Lily and Rhododendron Year Books* for 1949 have been published. The *Rhododendron Year Book* is a larger number than usual and contains the important papers read to the Rhododendron Conference together with the ensuing discussions.

New Plants of the Year, an illustrated volume dealing with the plants which received awards during 1948 has been published. *A Tentative Check List of Delphinium Names* was published during the year.

Further progress has been made with the Society's *Dictionary of Gardening*, edited by Mr. F. J. Chittenden, and much of this is now in type.

A third edition of the *Guide to Wisley Gardens* and a new edition of the *Vegetable Gardening Displayed* have been issued. It is hoped that the *Fruit Garden Displayed* may be ready during 1950.

Further progress has been made on the book on the *Plant Introductions of George Forrest*, which is being prepared in conjunction with the Royal Botanic Garden, Edinburgh, and work has been started on a book on *The Rhododendrons collected by Ludlow, Sheriff and Taylor*, which is being compiled in conjunction with the British Museum (Natural History) under the direction of Dr. George Taylor.

Examinations—At the General Examination in Horticulture there were 1,086 candidates, of whom 590 obtained the certificate. At the General Examination in Horticulture for Juniors, *i.e.*, those under 18 years of age, there were 215 candidates, of whom 109 were successful. The Examination for the National Certificate in Elementary Horticulture, which includes both written and practical work, was held at twelve centres. In all there were 239 candidates, of whom 24 passed in Division I and 186 in Division II. Of the 167 candidates who presented themselves for the Preliminary Examination for Teachers of School Gardening, 139 satisfied the Examiners that they should be allowed to proceed to the Final Examination another year. At the Final Examination, the practical part of which was held at Wisley, there were 21 candidates and 8 obtained the certificate.

The most important of the examinations conducted by the Society is that for the National Diploma in Horticulture, which is intended for professional horticulturists. Candidates for the examination must produce evidence of having been trained in or having followed the vocation of Horticulture for specified periods; both the preliminary and final examinations involve practical tests conducted at Wisley or elsewhere as well as written work. In 1949 there were 131 candidates for the Preliminary Examination, of whom 47 acquitted themselves sufficiently well to be allowed to proceed to the Final Examination in due course. At the Final Examination there were 55 candidates, 21 obtaining the N.D.H. In the Examination for the National Diploma in Horticulture with Honours, 5 candidates were awarded the N.D.H. (Hons.).

Programme for 1950—A full programme of meetings has been arranged for 1950. It has been decided to hold a Show on the last day of January, and the first day of February, principally at the request of Orchid growers. It is hoped, however, that other growers will be able to stage interesting displays. The Annual General Meeting, therefore, which will be held on February 14, will coincide with the second Show of the year. On the afternoon of the first day of every Show held in the Halls, except on the occasion of the Annual General Meeting, there will be a lecture. The Council is glad to be able to report that Mr. M. B. Crane, F.R.S., A.L.S., V.M.H., of the John Innes Horticultural Institu-

tion, has consented to give the Masters Memorial Lectures on "Developments in Modern Plant Breeding." These lectures will be delivered on August 1 and August 29.

Chelsea Show will be held on May 23 to 26. The arrangements will be similar to last year and the Private View will be held on the afternoon and evening of Tuesday, May 23.

There will be a Conference on Camellias and Magnolias on April 4 and 5. In connexion with this Conference there will be day excursions by motor-coach to various gardens in the Home Counties and a tour of gardens in Cornwall from March 25 to 30, which will include a visit to the Truro Show.

The Fruit Group, Lily Group and the Rhododendron Group have arranged programmes for 1950, particulars of which may be obtained from the Secretary.

Special Shows have, as usual, been arranged for Daffodils and for Fruit and Vegetables. The usual competitions will be held in conjunction with several fortnightly Shows.

Representation having been made that some Fellows are unable to leave their work sufficiently early properly to see the Fortnightly Shows, the Council has decided, as an experiment during the period of Summer Time, *i.e.* from April 4 to October 10 inclusive, that the closing hour on the first day of each Fortnightly Show shall be 7.0 P.M.

The Gardens at Wisley will be open as usual on all weekdays throughout the year (except Good Friday and Christmas Day) and on Sundays they will be open to Fellows and Associates and holders of Fellows' tickets from 2 P.M. to 6 P.M. from March 5 to September 24, and from 2 P.M. to 5 P.M. on Sundays in October. Twelve demonstrations on various practical gardening operations have been arranged and each will be repeated. Details will be published in due course in the JOURNAL.

Gifts—Mr. J. L. Richardson has very kindly presented to the Society a cup to encourage exhibits of Daffodils by amateurs and has expressed the hope that the cup would be called "The Bowles Cup" to commemorate the great service which Mr. E. A. Bowles, the Chairman of the Narcissus and Tulip Committee, has rendered in connexion with Daffodils. The Bowles Cup is being offered for award at the Daffodil Show.

The Victoria Medal of Honour—The Victoria Medal of Honour, which was established "to enable the Council to confer conspicuous honour on those British horticulturists, resident in the United Kingdom, whom it might from time to time consider deserving of special honour at the hands of the Society" has been awarded to: Mr. Montague Charles Allwood, F.L.S., for his work in connexion with Carnations and Pinks; Mr. Ernest Ballard for his work as a raiser of new Michaelmas Daisies; Mr. Edwin Ridgeway Janes in recognition of his great skill as an exhibitor of flowers and vegetables; The Rev. Canon Horace Rollo Meyer for his work in connexion with Irises, Daffodils and other bulbous plants; Dr. John Ramsbottom, O.B.E., M.A., D.Sc., F.L.S., for his work as Keeper of Botany at the British Museum (Natural History), especially in connexion with fungi.

The Veitch Memorial Trust—The awards made under the Veitch Memorial Trust “to those who have helped in the advancement and improvement of the science and practice of horticulture” are as follows: Gold Veitch Memorial Medal to Mr. Thomas Smith for his services to Horticulture and his book *The Profitable Culture of Vegetables*.

Silver Medal and £25 to Professor Wen-Pei Fang of the National Szechuan University, the Editor of the monumental work *Icones Plantarum Omeiensium*.

Associates of Honour—The Associateship of Honour, which is conferred on “persons of British nationality who have rendered distinguished service to horticulture in the course of their employment,” has been conferred on: Mr. A. J. Brooks, of Putney, S.W. 15, former Curator, Botanic Gardens, St. Lucia; Mr. F. C. Brown, the Society’s Trials Officer; Mr. R. J. Drew, of Messrs. Alex. Dickson & Sons, Ltd. (Hawtmark), Marks Tey, Essex; Mr. R. E. Farmer, Orchid grower to H. W. B. Schroder, Esq., Dell Park, Englefield Green, Surrey; Mr. H. J. Hall, gardener to the Earl of Harewood, Harewood House, Leeds; Mr. E. W. Studley, Parks Superintendent, Alexandra Park, North End, Portsmouth, Hants.

The Loder Rhododendron Cup, which is awarded “for work in connexion with Rhododendrons,” has been awarded to Mr. R. L. Harrow, V.M.H.

The A. J. Waley Medal, which is awarded “to a working gardener who has helped in the cultivation of Rhododendrons,” has been awarded to Mr. F. E. W. Hanger.

The Lawrence Medal, “for the best exhibit shown to the Society during the year,” has been awarded to the Commissioners of Crown Lands for an exhibit of Rhododendrons, Azaleas and other Trees and Shrubs, with Primulas, shown at Chelsea Show.

The Holford Medal, “for the best exhibit of plants and/or flowers (fruit and vegetables excluded) shown by an amateur during the year in the Society’s Halls,” has been awarded to Edmund de Rothschild, Esq., for an exhibit of Nerines shown on October 18.

The Sander Medal, “for the best new greenhouse plant of general utility shown to the Society during the year,” has been awarded to Lord Aberconway, C.B.E., LL.D., V.M.H., for *Jasminum polyanthum*, exhibited on March 15.

The George Moore Medal, “for the best new *Cypripedium* shown to the Society during the year,” has been awarded to Messrs. Sanders (St. Albans), Ltd., for *Cypripedium* ‘Crimea,’ exhibited on November 1.

The Williams Memorial Medal, “for the best group of plants and/or cut blooms of one genus (fruit and vegetables excluded) which show excellence in cultivation, staged at one of the Society’s Meetings during the year,” has been awarded to Messrs. Blackmore & Langdon, Bath, for an exhibit of Cyclamen on November 29.

The Reginald Cory Memorial Cup, awarded with the view of “encouraging the production of hardy hybrids of garden origin, to the raiser of a plant that is the result of an intentional cross.” Only a hybrid of which one parent is a true species is eligible, and it must have been exhibited at one of the Society’s Shows and received an Award during the

current year. Hybrids of annuals and biennials do not come within the scope of the Award. This cup has been awarded to Lord Aberconway, C.B.E., LL.D., V.M.H., for *Rhododendron* 'Elna,' shown on June 14.

The Council—Under Bye-law 44, each year three members of Council, who have served longest since their last election, retire. The retiring members are The Duke of Devonshire, K.G., The Hon. D. Bowes-Lyon, Mr. F. A. Secrett, C.B.E., F.L.S., V.M.H., and the Council wishes to place on record its appreciation of and its grateful thanks for the valuable services that they have rendered to the Society.

The Council has the right, under the Bye-laws, to nominate one of the retiring members to stand for immediate re-election and has so nominated the Hon. D. Bowes-Lyon, Treasurer of the Society. Happily the other two retiring members will continue to assist the Society on the various Committees of which they are members.

Committees, Judges, Examiners and Lecturers—The Council is deeply appreciative of the services rendered to the Society by the many Fellows who have given so much time on the various Committees or as Judges, Examiners and Lecturers, and tenders to them all its most grateful thanks for their services, so essential for the efficient carrying out of the work of the Society.

The Press—The Council records its appreciation of the support and help which the Society constantly receives from the Press.

The Staff—The Council takes this opportunity publicly to express to the Secretary and his Staff at Vincent Square and to the Director of the Gardens and his Staff at Wisley its deep appreciation of their loyal and valuable work during the past year.

Signed on behalf of the Council

December 31, 1949.

ABERCONWAY *President*

ACCOUNTS
AND
BALANCE SHEETS
1949

Dr. ANNUAL REVENUE & EXPENDITURE ACCOUNT

1948	To LONDON—	£	£
£	ESTABLISHMENT EXPENSES LESS ALLOCATIONS—		
4,944	Rent, Rates and Taxes	4,689	
11,348	Salaries and Wages	12,294	
8,796	Other Establishment Expenses, including Light, Fuel, Stationery, Professional Fees, and Renewals	8,429	
25,088			25,412
34,424	" WISLEY—		
	Net Expenditure for Year, as per separate Account		34,462
	" PRINTING AND POSTAGE OF PUBLICATIONS—		
14,979	Journal	19,008	
9,191	Other Publications	8,629	
24,170		27,637	
10,660	Less Sales and Advertisements	10,455	
13,510			17,182
2,369	" STAFF PENSIONS	2,562	
1,168	Less Contributions by Staff as per Scheme	1,255	
1,201			1,307
	" MEETINGS—		
	Expenses, Labour and Overheads of Special and other Meetings (including £4,000 Provision for Chelsea Show Works)	35,002	
29,528	Less Receipts	32,319	
29,477			2,683
51	" CUPS AND MEDALS		464
353	CONTRIBUTIONS TO LINDLEY LIBRARY, as per Trust Account—		
	Purchase of Books	494	
331	Salaries, etc.	1,394	
1,163			1,888
1,494	" SPECIAL EXPENDITURE—		
	Donation—Gardeners' Royal Benevolent Inst.	53	
	" Royal Gardeners' Orphan Fund	21	
	" British Colour Council	5	
	" Royal Geographical Society	10	
	" Roads Beautifying Association	50	
	" Northern Horticultural Society	300	
	" Dr. Hatton Testimonial	100	
	Expeditions	1,910	
2,800			2,449
2,425	" BOTANICAL MAGAZINE		1,386
	" EXAMINATIONS IN HORTICULTURE—		
	Expenses	2,599	
2,459	Less Fees	2,489	
1,785			110
674	" SCHOLARSHIP	262	
62	Less Contributions from—		
	Worshipful Company of Gardeners	£ 116	
27	Sir James Knott Trust	30	
8			146
27			116
	" RESTAURANTS—		
	Expenses, including Proportion of Overheads, less Receipts		128
214			
3,366	" OLD AND NEW HALLS SINKING FUND APPROPRIATION		3,366
6,100	" AMOUNT WRITTEN OFF FREEHOLD PROPERTY, WISLEY		2,500
	" BALANCE, being Excess of Revenue over Expenditure, added to General Reserve		10,124
6,283			
£98,020			£103,577

FOR THE YEAR ENDED 31st DECEMBER, 1949

Cr.

<i>1948</i>		
£		£
77,598	By ANNUAL SUBSCRIPTIONS AND DONATIONS	84,912
2,904	„ DIVIDENDS AND INTEREST	3,225
16,674	„ HALL LETTINGS, GROSS	14,432
	„ LIFE COMPOSITIONS—	
488	Being amounts transferred in respect of Life Fellows who have died during the year	636
346	„ RENT OF FREEHOLD PROPERTY (Wisley)	372

£98,020

£103,577

THE ROYAL HORTICULTURAL SOCIETY—

1948					
£	£		£	£	£
		CAPITAL FUNDS AND RESERVES			
	250,000	ACCUMULATED FUNDS ACCOUNT		250,000	
		GENERAL RESERVE ACCOUNT—			
54,772		Balance at 31st December, 1948	61,157		
6,283		Add Balance of Revenue and Expenditure Account,			
102		31st December, 1949	10,124		
		Surplus on Realisation of Investments			
	61,157			71,281	
	311,157				321,281
		DEPRECIATION AND OTHER FUNDS			
		OLD AND NEW HALLS SINKING FUND—			
68,073		Balance at 31st December, 1948	73,468		
1,993		Add Income on Investments for the year	2,138		
		Allocation from Revenue and Expenditure			
3,366		Account	3,366		
36		Surplus on Realisation of Investments	—		
	73,468			78,972	
	10,000	DEPRECIATION AND RENEWAL FUND		10,000	
		SHOWS CONTINGENCY FUND—			
3,806		Balance at 31st December, 1948	3,909		
103		Add Income on Investments for the year	106		
	3,909			4,015	
	507	MONOGRAPH FUND		507	
	87,884				93,494
		LIFE COMPOSITIONS			
29,598		As at 31st December, 1948	30,231		
488		Less Amount transferred to Revenue in respect of			
		Life Fellows who have died during the year	636		
29,110			29,595		
1,121		Add Compositions received during the year	845		
	30,231				30,440
		PROVISIONS			
		LONDON, DEFERRED REPAIRS			
12,000		Balance at 31st December, 1948	9,641		
2,359		Less Expended during year	3,870		
	9,641			5,771	
		WISLEY, DEFERRED REPAIRS			
5,234		Balance at 31st December, 1948	4,968		
4,266		Less Expended during year	4,669		
	968		299		
		Add Transfer from Revenue and Expenditure			
4,000		Account	2,000		
	4,968			2,299	
	—	CHELSEA SHOW WORKS		4,000	
	14,609				12,070
		CURRENT LIABILITIES			
4,546		SUBSCRIPTIONS IN ADVANCE	2,595		
		MEMORIAL AND OTHER TRUST FUNDS—			
		Balances of Income Accounts in the hands of the			
539		Society as per Separate Schedule	562		
21,144		SUNDY CREDITORS	15,374		
	26,229				18,531
	£470,110				£475,816

I have audited the above Balance Sheet, dated 31st December, 1949, and have obtained all the information and explanations I have required. In my opinion such Balance Sheet is properly drawn up so as to exhibit a true and fair view of the state of the Society's affairs according to the best of my information and the explanations given to me and as shown by the books of the Society.

F. G. FEATHER, F.C.A., Auditor.
(HARPER, FEATHER & PATERSON, Chartered Accountants),

10th January, 1950.

4 Lloyds Avenue, London, E.C. 3

LANCE SHEET, 31st DECEMBER, 1949

£	1948	£		£	£	£
FIXED ASSETS						
			OLD HALL, OFFICES, RESTAURANT, LIBRARY AND EQUIPMENT AT COST	79,266		
78,707			NEW HALL, RESTAURANT AND EQUIPMENT AT COST	167,795		
<u>167,706</u>		246,413				<u>247,061</u>
(Note.—The replacement of these Assets is provided for partly by means of the Sinking and Depreciation Funds <i>per contra</i> and also by charging the cost of replacement of Equipment direct to Revenue.)						
26,500			FREEHOLD PROPERTY, WISLEY, AT COST	29,263		
9,320			Less Amounts written off	11,820		
		<u>17,180</u>				<u>17,443</u>
		263,593				264,504
FUNDS INVESTMENTS, at Cost						
73,468			OLD AND NEW HALLS SINKING FUND	78,972		
			(Market Value 30th December, 1949, £77,987)			
10,000			DEPRECIATION AND RENEWALS FUND	10,000		
			(Market Value 30th December, 1949, £9,840)			
3,909			SHOWS CONTINGENCY FUND	4,015		
			(Market Value 30th December, 1949, £4,108)			
507			MONOGRAPH FUND	507		
			(Market Value 30th December, 1949, £506)			
		<u>87,884</u>				<u>93,494</u>
86,552			GENERAL INVESTMENTS, at Cost			96,552
			(Market Value 30th December, 1949, £92,472)			
		913	WISLEY ADJUSTMENT ACCOUNT			1,580
PUBLICATIONS IN COURSE OF PRODUCTION						
2,295			R.H.S DICTIONARY OF GARDENING	2,487		
1,111			MONOGRAPHS AND OTHER PUBLICATIONS	1,463		
		<u>3,406</u>				<u>3,950</u>
CURRENT ASSETS						
100			BOTANICAL MAGAZINE STOCK (Nominal Value)	100		
13,186			SUNDRY DEBTORS AND PAYMENTS IN ADVANCE	10,832		
14,476			CASH AT BANK AND IN HAND	4,804		
		<u>27,762</u>				<u>15,736</u>
£470,110				£475,816		

Dr.

WISLEY GARDENS—REVENUE & EXPENDITURE

1948			£	£
£	£	To ESTABLISHMENT EXPENSES—		
4,837		Salaries and Wages	5,400	
653		Rates, Taxes and Insurances	822	
2,320		Miscellaneous	2,941	
71		Annuities	70	
	7,881			9,233
		" LABORATORY AND SCHOOL OF HORTICULTURE—		
4,021		Salaries and Wages	4,381	
225		Miscellaneous	277	
36		Depreciation of Loose Effects	65	
	4,282			4,723
		" GARDEN—		
14,639		Salaries and Wages	15,884	
757		Seed Distribution <i>less</i> Receipts	775	
4,155		Miscellaneous	3,152	
35		Depreciation of Loose Effects	47	
250		Allocation to Depreciation and Renewal Fund	250	
	19,836			20,108
		" STAFF PENSIONS		
1,265		<i>Less</i> Contributions by Staff, as per Scheme	1,645	
634			803	
	631			842
	<u>£32,630</u>			<u>£34,006</u>
		28,348 To BALANCE, brought down		30,863
		" SPECIAL EXPENDITURE—		
		Temporary Housing Accommodation	745	
		War Memorial	330	
		Hostel Furniture	524	
	2,076			1,599
		" PROVISION FOR DEFERRED REPAIRS	2,000	
	4,000			
	<u>£34,424</u>			<u>£34,462</u>

WISLEY GARDENS—BALANCE

1948			
£	£	£	£
	34,546	ACCUMULATED FUNDS ACCOUNT	34,546
		ENDOWMENT TRUST FUND	
24,869		Balance at 31st December, 1948	23,977
892		Less Loss on Realisation of Investments	—
		Add Surplus on Realisation of Investments	471
—	23,977		24,448
		DEPRECIATION AND RENEWALS FUND	
11,530		Balance at 31st December, 1948	11,809
		Add Allocation from Revenue and Expenditure	
250		Account	250
29		Surplus on Realisation of Investments	624
—	11,809		12,683
	913	VINCENT SQUARE ADJUSTMENT ACCOUNT	1,580

£71,245

£73,257

HEET, 31st DECEMBER, 1949

1948		£	£
33,372	LABORATORY, DWELLING HOUSES, GLASS HOUSES, RANGES, ETC., at Cost		33,372
	N.B.—The Hanbury Trust Estate is, under the Trust Deed, vested in the Society only so long as it is in a position to use it as an Experimental Garden. Accordingly the Expenditure thereon by the Society is an Asset only so long as the Gardens continue to be used by the Society.		
23,977	ENDOWMENT TRUST FUND INVESTMENTS, at Cost		24,448
	(Market Value at 30th December, 1949, £25,131)		
11,809	DEPRECIATION AND RENEWALS FUND INVESTMENTS, at Cost		12,683
	(Market Value at 30th December, 1949, £13,065)		
	PLANT AND LOOSE EFFECTS (valued by the Director)		
1,374	As at 31st December, 1948	1,967	
664	Add Purchases during year	421	
2,038		2,388	
71	Less Depreciation of Garden and Laboratory Effects	112	
1,967		2,276	
120	FUEL STOCK (valued by the Director)	478	
£71,245		£73,257	

I have audited the books from which the foregoing Accounts are compiled, and certify that they exhibit a true and correct statement of the position on the 31st December, 1949. In the total of Assets, £73,257, are included Investments, at Cost, amounting to £24,448 representing The Endowment Trust Fund, the Capital of which is not available for use by the Society.

F. G. FEATHER, F.C.A., Auditor.
(HARPER, FEATHER & PATERSON, Chartered Accountants),
4 Lloyds Avenue, London, E.C. 3.

10th January, 1950.

	Investments at Cost.		Income Balance 31st Dec. 1948.		Income received during 1949.		Expenditure in 1949.		Income Balance 31st Dec. 1949.		(a) Investment Cost of books pur- chased by Society to 31st Dec., 1948 Books purchased by Society in 1949.		f. s. d.	
	f. s. d.	f. s. d.	f. s. d.	f. s. d.	f. s. d.	f. s. d.	f. s. d.	f. s. d.	f. s. d.	f. s. d.	f. s. d.	f. s. d.	f. s. d.	f. s. d.
1. ALFRED DAVIS TRUST FUND	1,446 14 8		47 0 10		37 8 8	37 8 8	48 11 4		Nil				1,509 10 2	
2. WILLIAMS MEMORIAL FUND	258 15 4		Nil		17 8 0	17 8 0	7 7 2		Nil					
3. MASTERS MEMORIAL FUND	542 17 0		8 7 2		0 0 (b)	0 0 (b)	2 13 10		9 16 8				16,668 17 4	
3A. MASTERS MEMORIAL EXPENSES	200 0 0		Nil		4 3 4	4 3 4	6 6 2		Nil					
4. NICHOLSON PENSION FUND	247 2 2		5 11 2		19 4 6	19 4 6	20 0 0		4 15 8				494 0 1	
5. SCHRÖDER PENSION FUND	557 14 6		57 16 5		32 16 3	32 16 3	30 0 0		60 12 8				18,672 7 7	
6. LINDLEY LIBRARY TRUST	18,672 7 7 (a)		132 8 5		44 4 4	44 4 4	17 13 2		158 19 2					
7. SIR JAMES KNOTT TRUST	875 1 9		32 19 6		7 16 6	7 16 6	3 15 7		37 0 5					
8. VETCH MEMORIAL TRUST FUND	1,742 0 11		158 10 0		15 8 5	15 8 5	Nil		123 18 5					
9. MOORE MEDAL TRUST	190 10 6		53 12 10		6 4 10	6 4 10	7 10 0		52 7 8					
10. SEWELL MEDAL TRUST FUND	532 14 4		4 18 10		5 19 0	5 19 0	6 0 0		4 17 10					
11. MRS. SHERMAN HOYT PRIZE FUND	208 1 2		Nil		31 17 11 (d)	31 17 11 (d)	31 17 11 (e)		Nil					
12. LORD RIDDELL TROPHY FUND	222 12 11		Nil		42 18 1	42 18 1	42 18 1 (e)		Nil					
13. DEDICATIONS VOLUME FUND (Botanical Magazine)			335 19 3		10 19 5	10 19 5	25 2 0		8 0 4					
14. THE COLMAN FUND	1,627 15 3		22 2 11		3 6 3	3 6 3	22 7 6		11 3 4					
15. P. D. WILLIAMS FUND	372 7 9		30 4 7		3 12 8	3 12 8	3 5 0		21 9 0					
16. THE GLAZEBROOK FUND	100 0 0		21 1 4		0 0 0	0 0 0	3 12 1		19 19 5					
17. A. J. WALEY MEDAL FUND	131 3 10		14 11 6		42 2 6 (f)	42 2 6 (f)	42 2 6		Nil					
18. HOLFORD MEDAL FUND	300 0 0		Nil		31 5 0 (g)	31 5 0 (g)	31 5 0		Nil					
19. HENRY GEORGE SEWELL PRIZE FUND	438 18 3		Nil						Nil					
20. McBEAN MEMORIAL TROPHY FUND	229 19 7													
			Total as per Balance Sheet £561 11 11											

Notes on above Funds:

1. Bequeathed to the Society in 1870 for annual prizes or any other object the Council may determine.
2. Raised by donations in 1908 in memory of the late Mr. B. S. Williams towards the provision of prizes and medals.
3. Raised by donations in 1908 in memory of the late Mr. B. S. Williams towards the provision of prizes and medals.
4. Raised by donations in 1908 in memory of the late Mr. B. S. Williams towards the provision of prizes and medals.
5. Provided by the Society in memory of the late Baron Schröder to pay to the Gardeners' Royal Benevolent Institution for the late Mr. George Nicholson.
6. The nucleus of the library is the fine collection of books and pamphlets which belonged to the late Dr. Lindley. It has since been added to by the books purchased by the Society and by the gifts of the late Mr. Reginald Cory and of private donors.
7. Presented to the Society in 1920 by the late Sir James Knott for the purpose of providing a scholarship towards the study of the history of the Society.
8. Instituted in 1870 in commemoration of the late Mr. James Vetch for the encouragement of Horticulture.
9. Instituted in 1870 in commemoration of the late Mr. James Vetch for the encouragement of Horticulture.
10. Presented to the Society in 1928 by the late Mr. A. J. Waley for the purpose of providing a trophy annually to be devoted to vegetables.
11. Presented to the Society in 1928 by the late Mr. A. J. Waley for the purpose of providing a trophy annually to be devoted to vegetables.
12. Presented by the late Lord Riddell in 1931 to provide a trophy annually to be devoted to publications.
13. Presented to the Society in 1936 by donations to provide medals to commence the late Mr. F. B. Williams.
14. Presented to the Society in 1937 by the late Mr. A. J. Waley for the purpose of providing a trophy annually to be devoted to vegetables.
15. Raised in 1936 by donations to provide medals to commence the late Mr. F. B. Williams.
16. Presented to the Society in 1947 by the late Sir George Holford for the purpose of providing a trophy annually to be devoted to vegetables.
17. Presented to the Society in 1947 by the late Sir George Holford for the purpose of providing a trophy annually to be devoted to vegetables.
18. Presented in 1947 by the Trustees of the late Sir George Holford for the purpose of providing a trophy annually to be devoted to vegetables.
19. Presented in 1947 by the Trustees of the late Sir George Holford for the purpose of providing a trophy annually to be devoted to vegetables.
20. Presented in 1947 by the Trustees of the late Sir George Holford for the purpose of providing a trophy annually to be devoted to vegetables.

GENERAL MEETINGS

OCTOBER 18, 1949

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRETT, C.B.E., F.L.S., V.M.H., in the Chair, and fifteen other members present.

Exhibits**Awards Recommended:***Gold Medal*

To Messrs. Carters Tested Seeds, Ltd., Raynes Park, London, S.W. 20, for a group of Mixed Vegetables (votes 14 for, 0 against).

Silver-gilt Lindley Medal

To Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, W.C. 2, for a group of Carrot varieties and Lettuce.

To Dr. John Ramsbottom, O.B.E., M.A., D.Sc., F.L.S., British Museum (Natural History), Cromwell Road, London, S.W. 7, for a collection of edible and poisonous Fungi.

Silver-gilt Hogg Medal

To P. G. Saunders, Esq., The Chevin, 29 Britonhill Road, Sanderstead, Surrey, for a group of Apples and Pears.

Other Exhibits

Apple Seedling, from J. C. Webster, Esq., 20 Elm Grove, Great Clacton, Essex.

Apple Seedling, from A. C. Blake, Esq., Whitefield House, Muddiford, Barnstaple, Devon.

Apples 'Galloway Pippin,' 'Evargil' and 'Queen Caroline,' from S. Abdy, Esq., 30 Bonnington Crescent, Sherwood, Nottingham.

Apple Seedling, from S. Penhaul, Esq., 10 Chycornick Terrace, Gulval, Cornwall.

Apple Seedling, from H. L. Pennicott, Esq., 37A Hollybush Road, Gravesend, Kent.

Apple Seedling, from A. L. Deadman, Esq., Log Cottage, Portsmouth Road, Hindhead, Surrey.

Apple Seedling, 'England's Wonder,' from J. B. England, Esq., 8 Basket Gardens, Eltham, S.E. 9.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended:*Silver-gilt Flora Medal*

To Messrs. Napier, Ltd., Taunton, for an exhibit of Chrysanthemums.

To Mr. Stuart Ogg, Swanley, for an exhibit of Dahlias.

To Edmund de Rothschild, Esq. (gardener Mr. B. Hendy), Exbury, for an exhibit of Nerines.

To Messrs. A. G. Vinten, Ltd., Balcombe, for an exhibit of Chrysanthemums.

Silver-gilt Banksian Medal

To Messrs. Bakers Nurseries, Ltd., Wolverhampton, for an exhibit of Asters, Korean Chrysanthemums and Gladioli.

To Mr. John R. Bell, Horam, for an exhibit of Chrysanthemums.

To Messrs. W. Wood & Son, Ltd., Taplow, for an exhibit of Dahlias.

Silver Flora Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations and other Dianthus.

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Cyclamen.

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of Dahlias.

To Messrs. Sutton & Sons, Ltd., Reading, for an exhibit of Korean Chrysanthemums.

Silver Banksian Medal

To Messrs. G. & R. Perry, Enfield, for an exhibit of rubellum Chrysanthemums.

To Messrs. Ryder & Son (1920), Ltd., St. Albans, for an exhibit of bedding Dahlias.

To Messrs. J. F. Spencer & Son, Ltd., Hockley, for an exhibit of Dahlias.

Flora Medal

To Mr. A. Miles, Bickley, for an exhibit of Chrysanthemums and Dahlias.

To the Orpington Nurseries Co., Ltd., for an exhibit of Korean Chrysanthemums.

To Mr. E. V. Roe, Reigate, for an exhibit of Chrysanthemums.

To Messrs. H. Woolman, Ltd., Birmingham, for an exhibit of Chrysanthemums.

Banksian Medal

To Messrs. G. & A. Clark, Ltd., Dover, for an exhibit of Chrysanthemums, Dahlias and other herbaceous plants.

To Messrs. Hale & May, Ltd., Cookham, for an exhibit of Chrysanthemums and other herbaceous plants.

To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of herbaceous plants.

Award of Merit

To Chrysanthemum 'Incurved Edith Alaton,' as a variety for exhibition (votes 18 for, 0 against), from Colham Green Nurseries, Ltd., Hillingdon, Middlx.

To Nerine 'Inchmery Elizabeth,' as a cool greenhouse flowering bulbous plant (votes 18 for, 0 against), from Edmund de Rothschild, Esq. (gardener Mr. B. Hendy), Exbury.

To Nerine 'Inchmery Kate' (votes 18 for, 0 against), from Edmund de Rothschild, Esq., Exbury.

To Nerine 'Nena' (votes 11 for, 4 against), from Col. R. S. Clarke, M.P. (Gardener Mr. W. Felming), Borde Hill, Haywards Heath.

Selected for trial at Wisley

Fuchsia, unnamed seedling No. 1 (*F. magellanica* × 'L'Enfant Prodigue'), from C. J. Hewlett, Esq., Earley, Reading.

Other Exhibit

Roses and Violas, from Mr. C. A. Jardine, Feltham.

Name of Rose

It was reported that Mr. Jan Spek's Rose, which received an Award of Merit when exhibited at Chelsea under No. 25/46, had been named 'Yellow Cluster.'

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and sixteen other members present.

Awards Recommended:

Silver Flora Medal

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of berried and foliage trees and shrubs.

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of berried and foliage trees and shrubs.

To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of berried and foliage trees and shrubs.

Silver Banksian Medal

To Messrs. Bide, Farnham, for an exhibit of conifers and other evergreen shrubs.

To Messrs. Hillier & Sons, Winchester for an exhibit of berried and foliage trees and shrubs.

Lindley Medal

To E. P. T. Goodyer, Esq., London, W. 1, for an exhibit of ornamental Gourds.

Flora Medal

To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of berried and foliage trees and shrubs.

To Mr. J. Hogger, Felbridge, for an exhibit of conifers.

To Winkfield Manor Nurseries, Ascot, for an exhibit of rock-garden plants and Asters.

Banksian Medal

To Mr. L. S. Harbutt, Newmarket, for an exhibit of evergreen shrubs.

To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.

To Kew Topiary Nurseries, Richmond, for an exhibit of clipped Box and Bay trees.

To Mr. J. O. Sherrard, Newbury, for an exhibit of berried and foliage trees and shrubs.

Award of Merit

To *Galanthus nivalis* subsp. *Olgae*, as a hardy, flowering bulbous plant (votes 12 for, 0 against), from Col. F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Highdown, Goring-by-Sea, Sussex.

To *Malus* 'Golden Hornet,' as a hardy ornamental-fruited tree (votes 15 for, 0 against), from Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, Surrey.

To *Nerine filifolia*, as a half-hardy flowering bulbous plant (votes 13 for, 0 against), from Col. R. S. Clarke, M.P., Borde Hill, Hayward's Heath, Sussex.

Other Exhibits

Clerodendron Bungei, exhibited by Mrs. Holden, Newbury.

Gentians, exhibited by Mr. C. Newberry, Knebworth.

Miniature Gardens, exhibited by Long Barn Gardens, Harlow.

Pyracantha × 'Watereri,' exhibited by Messrs. J. Waterer Sons & Crisp, Ltd., Bagshot.

Rock-garden plants, exhibited by Balcombe Nurseries, Swallowfield.

Salvia aurea, exhibited by Mrs. Tracey, Wimborne.

Extracts from THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY

GENERAL MEETINGS

NOVEMBER 1, 1949

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and nine other members present.

Scilla Tubergeniana seeding. Mr. Stearn drew attention to the form of the caruncle of the seed of *Scilla Tubergeniana* which was much larger than that of related species such as *S. sibirica*. The soft tissues of the caruncle are eaten by ants which in the process are apt to distribute the seeds. *S. Tubergeniana* rarely seeds in English gardens, apparently owing to weather conditions at flowering time, but Mr. Hoog has pointed out that bulbs planted and flowering late set seed freely, which Mr. Stearn has confirmed.

Aerial corm of Gladiolus—Mr. Balfour showed a *Gladiolus* plant with a well-developed corm about 1 inch in diameter in the axil of a leaf about 8 inches above ground; the new corm at the base had also developed well, and probably some obstruction in the vascular tissue of the stem just below the leaf subtending the aerial corm had led to accumulation of food at that place, and the formation of the corm to accommodate it.

Hygroscopic awn of Pulsatilla—A letter from Mr. H. W. Mallpress of Parkways, Welwyn Garden City, was read, in which he drew attention to the hygroscopic awn of *Pulsatilla vulgaris* (*Anemone Pulsatilla*). The seed was sown in a tray with the awn above the soil. He wrote, "One day when sprinkling the seed tray with a fine rose on the watering can, I noticed movement of the awns, which were now bent or leaning, and on observing them closely noticed they were slowly revolving in a manner that reminded me of the distributing arms on a sewage bed. The motion was clockwise and I estimated it took about 3 seconds for each to make a complete circular movement. About half-a-dozen complete circles were made before the motion ceased." This movement occurred each time the tray was sprinkled.

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRETT, C.B.E., F.L.S., V.M.H., in the Chair, and seventeen other members present.

Exhibits

Awards Recommended:

Gold Medal

To H. H. Crane, Esq., F.L.S., Highmead, Cheney Lane, Eastcote, Pinner, Middlesex, for a group of Apples and Pears (votes 17 for, 1 against).

Hogg Medal

To Winkfield Manor Nurseries, Ascot, Berks., for a group of Apples.

Selected for trial

Apple Seedling, from J. B. Wager, Esq., Ivy Cottage, Catteshall Lane, Godalming, Surrey.

Other Exhibits

Apple Seedling, from Mrs. L. A. B. Satterthwaite, 16 Ravenscroft Park, High Barnet, Herts.

Pear Seedling, from W. Ferguson, Esq., The Manse, Ballygoney, Moneymore, County Derry, N. Ireland.

Apple Seedling, from Messrs. Pennell & Sons, Ltd., 312 High Street, Lincoln.

Apple Seedling, from Colonel R. B. Phayre, M.C., F.L.S., Collatons House, Bow, Crediton, Devon.

Apple Seedling, from G. W. Dalman, Esq., 23 Hill View Crescent, Guildford, Surrey.

Apple Seedling, from C. Sampson, Esq., The Orchard, Common Road, Snettisham, Norfolk.

Apple Seedling, from W. G. Perkins, Esq., Crossways House, Hereford Road, Great Amwell, Ware, Herts.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended:

Gold Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.

Silver-gilt Banksian Medal

To Messrs. C. Engelmann, Ltd., Saffron Walden, for an exhibit of Carnations.
To Messrs. Sutton & Sons, Ltd., Reading, for an exhibit of 'Cascade' and 'Charm' Chrysanthemums.
To Messrs. A. G. Vinten, Ltd., Balcombe, for an exhibit of Chrysanthemums.

Silver Flora Medal

To Mr. J. R. Bell, Cross in Hand, for an exhibit of Chrysanthemums.
To Messrs. Blackmore & Langdon, Bath, for an exhibit of Cyclamen.
To the Borough of Malden & Coombe, New Malden, for an exhibit of Chrysanthemums.
To Mr. Th. C. Nieuwenhuizen, Aalsmeer, Holland, for an exhibit of Carnations.

Silver Banksian Medal

To Messrs. Anjerkweekerij', T, Clooster, Heemstede, Holland, for an exhibit of Chrysanthemums.
To Messrs. Napier, Ltd., Taunton, for an exhibit of Chrysanthemums.

Flora Medal

To the Orpington Nurseries Co., Ltd., Orpington, for an exhibit of Korean Chrysanthemums.

Banksian Medal

To Mr. A. Miles, Bickley, for an exhibit of Korean Chrysanthemums.

Award of Merit

To Chrysanthemum 'Cambria,' as a variety for exhibition (votes 10 for, 3 against), from Colham Green Nurseries, Ltd., Hillingdon.
To Chrysanthemum 'Winn Quinn,' as a variety for exhibition (votes 13 for, 0 against), from Colham Green Nurseries, Ltd., Hillingdon.
To Nerine 'Stephanie,' as a cool greenhouse flowering bulbous plant (votes 10 for, 0 against), from Col. S. R. Clarke, M.P. (gardener Mr. W. Fleming), Borde Hill, Haywards Heath.

Other Exhibits

Nerine 'Mrs. Clarke,' from Col. R. S. Clarke, M.P., Haywards Heath.
Violas and Roses, from Mr. C. A. Jardine, Feltham.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and thirteen other members present.

Awards Recommended:

Silver Flora Medal

To Messrs. Hillier & Sons, Winchester, for an exhibit of ornamental-foliaged shrubs and trees.

Silver Banksian Medal

To Mr. J. Hogger, Felbridge, for an exhibit of conifers.
To Messrs. D. Stewart & Sons, Ltd., Ferndown, for an exhibit of ornamental-foliaged and berried shrubs and trees.
To Winkfield Manor Nurseries, Ascot, for an exhibit of rock-garden plants and shrubs.
To Messrs. Wm. Wood & Son, Ltd., Taplow, for an exhibit of herbs and aromatic plants.

Flora Medal

To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of ornamental-foliaged and berried shrubs.

Banksian Medal

To Messrs. G. & A. Clark, Ltd., Dover, for an exhibit of berried shrubs and hardy flowers.
To Kew Topiary Nurseries, Richmond, for an exhibit of clipped Box trees.

Award of Merit

To *Euonymus europaeus* 'Red Cascade,' as a hardy, ornamental-berried shrub (votes 9 for, 0 against), from Messrs. George Jackman & Son (Woking Nurseries), Ltd., Woking.

Other Exhibits

Arbutus Unedo rubra, *Ruta graveolens* 'Jackman's Blue,' exhibited by Messrs. George Jackman & Son (Woking Nurseries), Ltd., Woking, Surrey.
Conifers, exhibited by Mr. S. Sims, Draycott.
Elaeagnus macrophylla, exhibited by Mrs. Gwendolyn Anley, Woking.
Gentiana, exhibited by Mr. C. Newberry, Knebworth.
Miniature Gardens, exhibited by Long Barn Gardens, Harlow.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and eleven other members present.

Awards Recommended:

Silver-gilt Banksian Medal

To Messrs. Sanders, St. Albans, for a group of Orchids.

Silver Banksian Medal

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

Award of Merit

Cypripedium 'Crimea' ('Balaclava' × 'Redstart') (votes 9 for, 0 against), from Messrs. Sanders, St. Albans.

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE—Mr. Geo. MONRO, V.M.H., in the Chair, and eleven other members present.

Exhibits

'Allwood's Golden Glory' (to be seen again), 'Allwood's Prolific' and 'Allwood's Market Pelargonium,' all shown by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex.

NOVEMBER 29, 1949

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and eight other members present.

Moles and Worms.—Mr. C. H. Hooper drew attention to statements in the press that moles made hoards of earth-worms, immobilizing them by biting their heads, and that worms so treated remained alive for some time and eventually grew a new anterior end and, if that had been damaged, a new tail. From enquiries which had been made as to the authenticity of this it had been learned that the source of the story was a paper published in the *Proceedings of the Zoological Society*, vol. 118 (1948), pp. 356 to 363, by Mr. A. C. Evans of Rothamsted. Doubt had previously been cast upon the fact of hoarding and also upon the ability of worms to regenerate parts. Mr. Evans had found worms in the mole hills in which regeneration was beginning and assumed it would go on if the worms were not disturbed. Dr. Parker, of the British Museum, was reported to have said that in the Family Lumbricidae, to which most of the British earthworms belong, considerable powers of regeneration are to be found. If the posterior end is cut off up to about fifteen segments a completely new tail may be grown. If only a few segments, up to about four, of the anterior end are cut off the worm may grow a completely new head in about seventeen days, but if more an imperfect head may be formed. The maximum amount is fifteen segments but then, as the sexual organs will have been cut off, it will be unable to reproduce itself; the wound, however, will heal, a mouth will develop and the worm will be able to continue its other activities and to move about.

Various Conifers, etc.—Commander Gilliland sent a remarkably fasciated leader, one of six on the plant, of *Cryptomeria japonica cristata* and a fasciated leader of *Sciadopitys verticillata* from a plant about 12 feet high. He also sent shoots of a species of *Callitris*, *Cupressus lusitamica*, *C. lusitamica flagellifera* and *Nothofagus fusca*. The following collected from Mr. E. H. Walpole's garden at Mt. Usher, Co. Wicklow, also came from him. Cones of *Taxodium distichum* and *Cunninghamia lanceolata*, *Athrotaxis selaginoides*, and a shoot of *Tetraclinis articulata* with many male cones shedding pollen. The last plant was severely damaged by frost in 1945 but has recovered and is now about 20 feet high.

Maize with mixed inflorescence.—Prof. Stoughton showed a specimen of Maize with several female flowers developing grains on a shoot from the base of the male inflorescence.

Narcissi.—Mr. C. C. Mountfort, of Woodside, Ferndown, Dorset, sent flowering specimens of the Moroccan species, *Narcissus Broussonetii*, remarkable for the primitive condition of the corona, and the green flowered *N. viridiflorus*. Mr. Bowles drew attention to the stages in development of the *Narcissus* corona as seen in various species and fully set out in his Handbook of *Narcissus*.

Gentiana fascicularis.—Mr. J. R. Sealy, of Kew, has now determined the plant shown on September 7, 1948, from Wisley, and raised from Assam seed, KW 16020, to be *Gentiana fascicularis*, figured in *Bot. Mag.* 4838 as *Crawfurdia fasciculata*. See *Kew Bulletin*, 1949, pp. 311-317.

FRUIT AND VEGETABLE COMMITTEE—Mr. A. CHEAL in the Chair and 21 other members present. Mr. F. J. CHITTENDEN was in attendance.

Exhibits

Awards Recommended:

Silver Hogg Medal

To Shenley Hospital, nr. St. Albans, Herts., for a Group of Apples.

Hogg Medal

To Messrs. Daniels Bros. Ltd., Norwich, for a Group of Apples.

Other Exhibits

Apple Seedling from H. F. S. Bale, Esq., Hollytop, 22 Greenhayes Avenue, Banstead, Surrey.

Apple 'Laxton's Royalty', from J. H. Loudon, Esq., Olantigh Gardens, Wye, Ashford, Kent.

Apple 'Marian Seymour,' from Miss W. M. Dibdin, New Flowers, By Sonning Bridge, Sonning, Reading, Berks.

Apple 'Goodwins' Russet,' from R. A. Goodwins, Esq., 131 Clarence Road, Four Oaks, Sutton Coldfield, Birmingham.

Apple 'Soutermere,' from J. W. Souter, Esq., 3 Sicklemill Cottages, Haslemere, Surrey.

Apple Seedling from F. James, Esq., 34 Brighton Road, Aldershot, Hants.

Apple 'Grain's Ideal,' from Mrs. C. Grain, Montclare, Lydd Road, Camber, nr. Rye, Sussex.

Apple Seedling, from R. A. Cumberland, Esq., Felmersham, Bedford.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair and eighteen other members present.

Awards Recommended:

Gold Medal

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Cyclamen.

To Messrs. Sutton & Sons, Ltd., Reading, for an exhibit of Cyclamen.

To Messrs. H. Woolman, Ltd., Birmingham, for an exhibit of Chrysanthemums.

Silver-gilt Flora Medal

To Messrs. A. G. Vinten, Ltd., Balcombe, for an exhibit of Chrysanthemums.

Silver-gilt Banksian Medal

To Dales Nurseries, 'Tarvin, for an exhibit of Chrysanthemums.

To Messrs. Keith Luxford & Co., Sawbridgeworth, for an exhibit of Chrysanthemums.

To His Grace the Duke of Norfolk (Gr. Mr. L. Wiseman), Arundel Castle, Sussex, for an exhibit of Begonias.

Silver Flora Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.

To Mr. John R. Bell, Cross in Hand, for an exhibit of Chrysanthemums.

To Mr. A. G. Campbell, Dunstable, for an exhibit of Cyclamen.

To Messrs. Greenyer Bros., Ltd., Worthing, for an exhibit of Chrysanthemums.

To Messrs. E. J. Horton & Son, Dunstable, for an exhibit of Cyclamen.

To Messrs. F. Webb & Sons (Stourbridge) Ltd., Stourbridge, for an exhibit of Begonias and Cyclamen.

Silver Banksian Medal

To Messrs. Napier, Ltd., Taunton, for an exhibit of Chrysanthemums.

To North Mymms Market Gardens, Hatfield, for an exhibit of Cyclamen.

To Messrs. Toogood & Sons, Ltd., Southampton, for an exhibit of *Primula obconica* 'Giant Hybrids.'

Flora Medal

To Messrs. G. & A. Clark, Ltd., Dover, for an exhibit of Chrysanthemums and shrubs.

Banksian Medal

To Iynwood Nurseries, Teddington, for an exhibit of Primulas, Azaleas and Cyclamen.

Award of Merit

To Chrysanthemum 'Rotary' as a variety for exhibition (votes 12 for, 0 against), from Messrs. H. Woolman, Ltd., Birmingham.

Other Exhibits

Chrysanthemums 'Freda Perry,' 'Orange Girl,' 'Prescilla,' 'Red Warrior,' from Messrs. H. Woolman, Ltd., Birmingham.

Chrysanthemum 'Leah's Green Glory' (syn. 'Madame Edmund Roger') from E. Leah, Esq., Fairwarp.

Chrysanthemum 'Primrose Favourite' from G. W. Darby, Esq., Welwyn.

Narcissus Poetaz 'Cragford', from Messrs. G. Zandbergen-Terwegen, Sassenheim, Holland.

Violas and Roses, from Mr. C. A. Jardine, Feltham.

PATRONS, COUNCIL AND OFFICERS, 1950.

PATRONS

THEIR MOST GRACIOUS MAJESTIES THE KING AND QUEEN
HER MOST GRACIOUS MAJESTY QUEEN MARY
H.R.H. THE PRINCESS ROYAL

PRESIDENT

LORD ABERCONWAY, C.B.E., LL.D., V.M.H.

VICE-PRESIDENTS

Lieut.-General HIS HIGHNESS THE MAHARAJA OF JAMMU AND KASHMIR, G.C.S.I., G.C.I.E., K.C.V.O.	Dr. ERNST H. KRELAGE F. CLEVELAND MORGAN B. Y. MORRISON
Field-Marshal THE RT. HON. JAN C. SMUTS, P.C., C.H., F.R.S., K.C.	C. G. A. NIX, V.M.H. Colonel THE HON. SIR HEATON RHODES, K.C.V.O., K.B.E.
Professor L. H. BAILEY, LL.D., LITT.D. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H.	SIR WILLIAM WRIGHT SMITH, M.A., F.R.S., F.R.S.E., F.L.S., V.M.H.

TREASURER: THE HON. DAVID BOWES-LYON

COUNCIL

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PROFESSOR OF BOTANY

SIR WILLIAM WRIGHT SMITH, M.A., F.R.S., F.R.S.E., F.L.S., V.M.H.

EDITOR OF "CURTIS'S BOTANICAL MAGAZINE"

W. B. TURRILL, D.Sc., F.L.S.

EDITOR OF "R.H.S. DICTIONARY OF GARDENING"

F. J. CHITTENDEN, O.B.E., F.L.S., V.M.H.

EDITOR

P. M. SYNGE, M.A., F.L.S.

LIBRARIAN

W. T. STEARN, F.L.S.

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J. S. L. GILMOUR, M.A., F.L.S.

SECRETARY

Brigadier C. V. L. LYCETT, O.B.E., B.A.

DEPUTY SECRETARY

A. SIMMONDS, V.M.H.

AUDITOR : F. G. FEATHER, F.C.A. (Messrs. HARPER, FEATHER & PATERSON,
Chartered Accountants)

BANKERS : WESTMINSTER BANK LIMITED (Victoria Branch)

SOLICITORS : MESSRS. GARRARD, WOLFE & COMPANY

Extracts from THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY

ANNUAL GENERAL MEETING

FEBRUARY 14, 1950

REPORT OF PROCEEDINGS of the ONE HUNDRED AND FORTY-SIXTH ANNUAL GENERAL MEETING, held in The Lecture Hall, Greycoat Street, Westminster, on Tuesday, February 14, 1950.

Lord ABERCONWAY, C.B.E., LL.D., V.M.H., President, in the Chair, with Members of Council and over two hundred and fifty fellows.

The PRESIDENT: As our Secretary is indisposed and has been ordered by his doctor not to return for another week, I will ask the Deputy Secretary to read the Notice convening the Meeting.

Mr. SIMMONDS (Deputy Secretary) read the notice convening the meeting, and announced that the notice had been circulated in accordance with Bye-law 17.

The PRESIDENT: The next item is the confirmation of the Minutes.

The DEPUTY SECRETARY: The Minutes of the last meeting held 12 months ago were circulated in the April JOURNAL for last year.

The PRESIDENT: The Minutes have been circulated, have I the approval of the Fellows to signing those Minutes as correctly recorded?

(The Meeting agreed.)

The PRESIDENT: You will observe that there has been a small change in the date of this meeting from that originally proposed. As a result of that change—the large Hall was found to have been let some time previously to an Association of Organisers of Fun Fairs, the large Hall being just through the door behind me—if you are disturbed by such horticultural ditties as “Daisy, Daisy” on a steam organ, or perhaps worse still from my point of view, “Hush, hush, hush ! here comes the Bogeyman,” a tune I used to whistle in the street when I was a small boy, but which very few of you here are old enough to have whistled with me—(Laughter)—but if you hear this delectable music, it will not be because the Council desired to set this Annual Meeting to music. It is an accident, and I am the culprit.

I had some business meetings in America, and I wanted to spare a few hours from those meetings to see the three great American Flower Shows, Boston, New York and Philadelphia. They are wonderful shows, different from our Shows. The accent in our Shows is laid very largely on new plants; in their Shows the emphasis is very largely on a picturesque display of existing and well-known plants. I wanted to take to our good friends, the horticulturists and gardeners over in the States, if I might do so, from you at this meeting a message of gratitude for what

they have done for us in past years—(applause)—a message of congratulations on the progress they are making every year with gardening in the United States, and all best wishes for the future, because I know that such a message from you assembled here would be greatly welcomed and appreciated there. (Applause.)

Now I always deal at this meeting with the question of the number of our Fellows. A savage can count up to ten on his fingers, after that he says "It is a lot." Well, I can do more than ten, but after five or ten thousand we do not appreciate what numbers mean. Now our total strength at the end of last year, December 31, was 36,268, the increase in the previous 14 months was 3,053, an odd number of months because in 1948 we brought them in on a different date in the year. Since December 31 we have elected a further 721 Fellows, and we are now only 550 below the highest that we have ever achieved, which was just before the war.

Those figures make us all in this room very proud, chiefly because it means that we have so many garden lovers in this country. Our gardens may be smaller, as the result of Sir Stafford Cripps and the Coal Controller, but we still take an interest in them, and when people come to Chelsea they come to see the Show—I do not think that the ladies even on wet days come to see, as the shops would put it "our latest fashions in waterproof footwear," they come to see the plants. I am afraid it is often very crowded at Chelsea, and I think of a bus conductor who said to the large queue waiting outside: "We are the last bus and the bus is full, but you can all come in if you are prepared to sit familiar." (Laughter.) I am afraid that is very largely the case at Chelsea.

What we have done in the last two years is to see that the Fellows get a substantial amount of priority; we give that by keeping certain times for Fellows only, but of course with that great number of Fellows it does not mean that everyone has as much room as they would wish. I think, however, that if one had a dream and awakened to find oneself at Chelsea on the best afternoon, and the tents were empty except for the kind people who try and sell one plants, that one would be very frightened and upset and rather inclined to run away from the whole thing. A Show is better when it has a certain number of people in it. Now—people like to see the Show in the afternoon, and if by some means, by reducing the number of our Fellows, by holding the Show for a greater number of days—if the plants would stand it which they would not—we were to reduce the number of people coming in the afternoon, it would merely mean that those who would otherwise have come in the morning, would crowd in in the afternoon, and you would get the afternoons as full as ever. That is why we cannot give you vacant tents or even comfortably uncrowded tents on every afternoon.

But there is another thing too that we ought to be very proud of when we look at the Fellowship figures, and that is that we are members of an organization which attracts all these Fellows to itself, and by what we hear satisfies most of them.

Now that is due very largely to our Staff. There is Brigadier Lycett, our Secretary, who was supposed to be, and I have no doubt was, one of the most tactful men in the Services, and he is very tactful now.

There is Mr. Simmonds, who arranges all our Shows so beautifully (applause)—I believe even those who will smoke pipes when they are arranging the flowers, which for some reason is against the rules, hide those pipes away when Mr. Simmonds approaches. He also will spend thousands and thousands of pounds as the Treasurer will tell you, on improving the drains at Chelsea.

Then we have Mr. Gilmour, the Director of Wisley, and Mr. Hanger, the Curator, who between them have improved Wisley out of all recognition in the last three or four years. (Applause.)

And there is our old friend, Mr. Chittenden (applause) working away behind the scenes these days, because he is occupied on that momentous volume, the R.H.S. *Dictionary of Gardening*, to be printed by the Oxford University Press. I believe most of it is, I heard from him to-day, already in type. We all of us congratulate him most heartily on the award of the O.B.E. which was bestowed on him by His Majesty The King in the New Year Honours List this year. (Applause.) He has done great work for us and for horticultural education.

Then we have with him dealing with our publications, Mr. Synge, who has not been so long with us; during the time he has been with us, you will have noticed a very great improvement in the style and readability of our various Year Books. We have a set of Year Books which, each in its way, is an example and sets a very high standard indeed.

Then we have the Scientific Staff at Wisley always ready to help our Fellows; some of the questions which they get are rather foolish, such as "I sowed carrots on this spot of land and nothing but horse-radish has come up"—(laughter)—and of course our Scientist points out that probably the horse-radish was there before and that a beetle ate the carrots. One man wrote and wanted to know where he could buy the seed of the yew tree which grew in the shape of a peacock. (Laughter.)

Then we have our admirable Librarian, who not only knows where all the books under his charge are, and on which shelf—and there are a great many—but also knows what is inside them, which is a very valuable thing when you wish to consult the library.

But we have other advantages besides our Staff, we have the Fellows themselves, generous to our faults, very generous of their help which they give without reward, but they give it because it helps that horticulture which they love. From the Council onwards, we have access to vast stores of knowledge and good judgment; our Fellows come from great distances to help us, and curiously enough, with all these diverse interests, the amateur and the professional, the exhibitors and the observers, we never have quarrels. A lot of societies take up a good deal of their time quarrelling, but horticulturists will not quarrel. It would be dreadful if a quarrel broke out in the Hall, and the Orchid people hurled Orchids in pots, while the Vegetable section hurled Tomatoes; whether the bruising power of the Orchid would be greater than the spreading power of the Tomato, we have never yet had the opportunity of observing. (Laughter.) But I do know that gardeners are very generous to one another. Of course we all feel that our own plants are, after all, much better than our neighbours', but if our neighbours get prizes and we do not, we always congratulate the man who gets the prizes, and are very

generous to the plants he has shown. There is a very fine spirit among our Fellows, as there is between horticulturists generally.

Then there are our exhibitors; they have very hard work, I have been an exhibitor and I know what hard work it is, and I know how at the end of the evening before the Show, you sit down on a packing case studded with sharp nails—(laughter)—and think of the watering you will have to do very early next morning before the Show opens. They are always improving their plants, and I did hear a rumour that an application will soon be made to the Council to enlarge some of the entrances into the Show Hall, in order that some of the very large flowers, such as the crimped Chrysanthemums, may be brought in without disturbing their perms. (Laughter.)

I give you this catalogue, of those who help us, but it is not a complete catalogue, especially of our Staff; to say of one is to say of all :—we are out to please you ; we are out to interest you :—I will say also we are out to educate you, because no gardener in this room, from the Council onwards, cannot be educated further in the great science of gardening. We all have got things to learn: at Shows, in one another's gardens, at lectures, and we none of us resent being taught things which we ought to know.

For doing all these things, our reward, ladies and gentlemen, which you give us so generously, is your approval.

Now there is the question of the Annual Report. The Annual Report I generally deal with, but we have done it so thoroughly this year that all the points I wished to make are already put before you in cold print which I have no doubt you have diligently assimilated; but I would point out just one or two things.

We are having on April 4 and 5 a Camellia and Magnolia Conference. It is the first time that we have had Shows devoted to these two plants, and we do hope that anyone who can show a Camellia or a Magnolia will do so. We want to show our foreign friends—and there are a great many people coming from abroad, from America and France especially, what we can do, and if there is no disturbing frost, I hope we shall be able to make a good show.

Then we were impressed by the way the Services in this country, the Navy, the Army and particularly the R.A.F., were cultivating fruit and vegetables. We have an Autumn Fruit and Vegetable Show, and we are giving two large silver trophies to be competed for by the Services.

Our offices have been inconveniencing us for some time now. As the Fellowship increases, as the work increases, the Staff must increase, and we are very, very short of room. That steel structure which you see in the Old Hall is the beginning, as I dare say many of you know, of a small gallery of new offices for the Staff. We have no room for them on the ground floor; we cannot put them in the basement, and therefore we have to put them up in the air. And if you hear coming from above your heads sweet voices singing as they work, you will know that it is our Staff. I am not quite sure whether the Secretary or Mr. Simmonds like the Staff to sing as they work, but they are a very industrious Staff. You know the definition of "potential energy," a definition exemplified

in some Government Departments: 'Potential energy on the part of the Staff is being in a position to do work but not actually doing it.' (Laughter.) These new rooms are not being built for members of the staff with that type of potential energy.

So Ladies and Gentlemen, I will go from this very friendly meeting and carry your best wishes to our American friends, and I trust you will continue your warm approval of the work that we are doing for you.

I would like to move—

THAT the Report of the Council be approved and adopted; and I will ask the Treasurer to second that motion, and make a statement on the Society's financial position. (Applause.)

THE HON. DAVID BOWES-LYON (Treasurer). Mr. President, Ladies and Gentlemen, I understand that the Secretary recently received a typed postcard from the United States addressed to "The Remnant of the Royal Horticultural Society, London." (Laughter.) From the nature of the message on the other side of the card, I should think our correspondent probably wrote from a Mental Home, but if Lord Aberconway during his visit to the States should happen to encounter our correspondent—I am not suggesting that he will be visiting such institutions, but it is wonderful how he gets around on these trips—but if he should meet this correspondent or anybody else who thinks the Royal Horticultural Society is but a remnant to-day, I am sure he will put them right, and inform them that we are indeed flourishing and in a sound financial position.

This sound financial position has been circulated to all the Fellows in the JOURNAL in the shape of our Annual Accounts. They are in great detail, and those of you who are interested in the Accounts will have read them in great detail; those of you who are not interested will not have read them at all, and therefore will not want to hear them in great detail this afternoon. But I have to make a Treasurer's statement to you, so I will try and point out some of the principal and more interesting items in the Accounts this year.

First of all, as regards our income, that has increased by a few thousands this year, and we have achieved a new landmark, in that our income for the first time in our history has topped the £100,000 mark. (Applause.) That I think is very satisfactory. It is due largely to increased subscriptions coming in. Now I expect you would like to know how that money has been spent. It has been spent principally in the following manner.

Vincent Square and this Hall costs us about £25,000 a year. I do not think this is excessive seeing the great amount of work that takes place in these two establishments.

Our next big item of expenditure is our garden at Wisley. That cost us this year £34,000 which is a lot of money. It is actually £2,000 more than the previous year. That is almost entirely due to the fact that the new minimum wage rates have been operating for a full year for the first time.

Then another big item in our expenditure is our monthly JOURNAL. Some of you may remember at last year's meeting I forecast that our

JOURNAL would cost us more in the coming year. I am afraid it has. This year it has cost us £19,000, that is £4,000 more than last year. I fear I cannot hold out any hope that it will get cheaper, in fact I anticipate that this coming year it will cost us even more, partly because we shall be printing more copies, and partly because costs of publication increase all the time. These are really the principal items of expenditure.

There is one other item about which some of you may have been puzzled, it comes under the heading of "Meetings", and it is an item of £4,000, directed towards Chelsea Show works. In point of fact, it is what the President has already referred to, it is further cost of drainage at Chelsea. It is only a part of what the total cost will be, but we thought it was prudent to write off the whole amount of this initial cost in last year's Accounts. I am assured by the Secretaries that when these drainage operations have been finally completed at Chelsea, that no matter how hard it may rain, we shall never see a puddle again. (Laughter.) Whilst I am sure that will be a very great gain to our Fellows and to the general public, I am not sure that it will be altogether welcomed by our friends, the Press Photographers, who seem to find the best news value at Chelsea to be a picture of a pair of Nylon stockings amply splashed with Chelsea mud. (Laughter.)

I think that is all I have to tell you about the Income and Expenditure side. The Balance Sheet is quite clear. I have no comments to make on it, except that some of you may have noticed that the market value of our investments for the first time over a long period is a little bit less than they cost us. That is really due to the fact that we depleted our funds during the war when expenses were greater than our income. Then we had to sell funds, and since then we have been busily trying to build up our funds again, and as many of you must know, Government stocks were at a phenomenal price when we had to buy them. It is only these last six months when the pound was devalued, and other major factors beyond our control began to operate, that all these stocks fell so tremendously. So it is not surprising that we show a very small depreciation on the cost of our investments. It does not worry me, because I am sure our policy is a right one, that when we have funds to invest we put them into Government stocks; they are all dated stocks and the money will come back eventually to the Society.

That is all I need to report about. I hope you do not think our expenses are too high. I sometimes think they are very high myself, but our Society stands so high in the horticultural world—and indeed the whole world—taking into account the work done at Wisley and our really first-class publications and splendid Shows, and if these standards are to be maintained, and we are to keep our position as the greatest Horticultural Society in the world, it will cost money, and I do hope you will not grudge it.

I have much pleasure in seconding the Report. (Applause.)

The PRESIDENT: The adoption of the Report has been moved and seconded. Does any Fellow wish to ask any question on the Report? If not, I will put it to the meeting.

(Motion put and carried unanimously).

Mr. A. E. BOWLES (Vice-Chairman): My Lord Chairman, Ladies and Gentlemen, once again I stand here before you to say my little piece. It is the same little piece as it has been for a long time, and I hope even if I am not here to say it others will, for many years to come. It is to give you the good news that Lord Aberconway, at the unanimous request of the Council, allowed his name to be put forward for election as our President. (Applause.) As there is no other nomination—I am sure you will all agree that was the right thing to happen—under Bye-Law 59, I declare that Lord Aberconway is duly elected our President for 1950. (Applause.)

The PRESIDENT: I thank you with the very greatest cordiality, and not only you but the very many thousands of Fellows who have contributed to my election as President by not nominating anyone else. (Laughter.) I regard it as the very greatest honour that could be paid to any gardener. This is a most wonderful Society, and to occupy the position of its President is a most wonderful thing, the most wonderful thing that has ever happened to me, except only when I became engaged to be married. But Mr. Bowles rather seems to forget that I have occupied this Chair for I think 19 years, which is a long time, and you may think it quite long enough for one man to be in the Chair. Although I should be grieved to vacate this position, I should quite understand it if I were not elected, and I should feel no grievance at all, but only gratitude that I had been left in undisturbed possession of it for so many years.

But there is another reason why I enjoy this position, apart from the honour, apart from my delight in the work which I undertake, and that is because of the unwavering friendliness of my constituents—if I may call them so. Even if it is labour of love, it makes all the difference if you are doing it in a friendly atmosphere to an appreciative audience. Ladies and Gentlemen, I thank you from the bottom of my heart. (Applause.)

Now comes the question of the election of the Vice-Presidents, and in accordance with Bye-Laws 57 to 61, I declare that the following are duly elected:—

Lieut.-General His Highness The Maharaja of Jammu and
Kashmir
Field-Marshal the Rt. Hon. Jan C. Smuts
Professor L. H. Bailey
Mr. E. A. Bowles
Dr. Ernst H. Krelage
Mr. F. Cleveland Morgan
Mr. B. Y. Morrison
Mr. C. G. A. Nix
Col. the Hon. Sir Heaton Rhodes
Professor Sir William Wright Smith

They are all very distinguished people drawn from various quarters of the world; they are also all most distinguished horticulturists. It is a very great honour to have them as our Vice-Presidents. (Applause.)

Then, as members of Council, there have been elected the Hon. David Bowes-Lyon; he is a wonderful Treasurer and knows all about finance; he is great on details and goes into everything very thoroughly; I am sure that while he is Treasurer our affairs will be conducted with the very greatest economy and skill. (Applause.)

Next, the Hon. Lewis Palmer; he has been on our Council before and is a most valuable addition to it, full of knowledge of all kinds, and again with a very sound judgment especially on financial matters.

The third member is Mr. A. Cheal. He has also been on the Council before and is of the greatest help to us in all questions that arise in regard to our Shows, exhibits, and matters of that kind, as well as being a man of the soundest possible judgment. (Applause.)

We elect as Treasurer, The Hon. David Bowes-Lyon, he is both a Councillor and Treasurer, and you elect him to both offices.

Then as Auditor, we elect Mr. F. G. Feather. He is the quickest Auditor I have ever struck in completing our Accounts at the end of the year. We put a great task on him, because we ask for very elaborate accounts within a very few days of the close of the year.

That is the last of the elections.

I now have to present certain awards, always a very pleasurable task to me and to those who have obtained these awards. The names have been very carefully scrutinized and debated by the Council before they are put on the List, and all most thoroughly deserve them.

The first one is our Friend Mr. M. G. ALLWOOD.

Mr. Allwood, I have for you the Victoria Medal of Honour. You have put up some wonderful Shows in our Hall, but still more wonderful is the position your name has gained in horticulture. You have got a new race of plants named after you, the Allwoodii—I hesitate to say whether they are Carnations or Pinks, I believe they are Carnations, but they are a unique thing, and your name will be associated with that pleasant plant for all time. Other people have been associated with things, the great Mr. Gladstone with, I think, a bag—(laughter),—Lord Brougham with a closed carriage, Mr. Hansom with a cab; and the unfortunate owner at that time of the name of Mackintosh, with a garment. You, Mr. Allwood, are associated with a much pleasanter thing; your Carnations are an ornament to our gardens and a pleasure to our noses. (Applause.)

The next recipient of the Victoria Medal of Honour is Mr. ERNEST BALLARD.

Mr. Ballard, we admire more than I can say the wonderful number of varieties of Michaelmas Daisies that you have produced. You have given quite a new standard to that beautiful race of plants; you have had an Award of Merit for I believe no fewer than 34 varieties. I do not want to compare you numerically with Mr. Heinz, but I hope you will eventually rival him. (Laughter.) I have great pleasure in presenting you with the Victoria Medal of Honour. (Applause.)

Mr. E. R. JANES is the next recipient of the Victoria Medal of Honour. Mr. Janes, after gaining a great reputation as a cultivator and exhibitor, as a Head Gardener in a private garden, joined Messrs. Sutton's staff in 1919, and for thirty years was responsible for those wonderful exhibits of vegetables and flowers which repeatedly won cups at Chelsea and at our other Shows—in recent years for those great developments in *Primula malacoides* and other greenhouse plants. I remember how at the Chelsea Shows Mr. Janes used to come many days before the Show opened, and commenced to dig down, and would raise great mountains of soil, and then clothe them with most wonderful greenhouse and annual plants, making a display which I do not think you could have seen in any other Show in the whole world. I almost think a lot of Mr. Simmonds's trouble with the drains is due to this. (Laughter.) I am glad to hand you this Victoria Medal of Honour which as you know is the highest award the Council has to bestow. (Applause.)

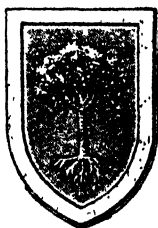
The next recipient is the Rev. Canon ROLLO MEYER, one of those great Churchmen who has helped horticulture so much. We cast our minds back earlier to records, to Dean Herbert, who did so much for Amaryllis; to Mr. Wilks, who placed the Royal Horticultural Society on its feet when it was in the depths of a depression, and by his ability as Secretary worked it up and up, as well as giving us those wonderful Shirley Poppies; there was Dean Hole of Rose fame; there was Canon Ellacombe with a wonderful garden in Gloucestershire; if you went to his garden you never got away without a packing case full of plants and cuttings. There was a time when he asked the wife of a neighbouring vicar to come and see his garden; she was a keen gardener, and as she went out of the door, she saw a great tree, a Californian Bay, very strongly scented and rather a poisonous plant, on which she remarked; he said "Take a piece with you," and cut two great branches, put them in the brougham—they had horses then—and slammed the door. When she got back to the vicarage she was unconscious, the doctor was sent for, he came at once to the vicar's house and after seeing her said to the vicar, "I am very sorry to have to tell you, Sir, for it will be a great shock, but your wife I am sorry to say is dead drunk. (Laughter.) Of course you can be too hospitable. Then there was Canon Boscawen, and now the Bishop of Truro, who has taken up the flag on behalf of the Church, and is a great expert on those things which Cornwall gives us. You Canon Rollo Meyer have helped us with many things, and most especially with Irises and Daffodils. May you continue helping us, Canon, for very many years. (Applause.)

The last recipient, is Dr. J. RAMSBOTTOM. We have had a letter of apology from him, he is unable to be here to-day, but I think that Mrs. Ramsbottom will receive his Medal.

Mrs. Ramsbottom, I am very sorry that Dr. Ramsbottom is not here to-day, I hope his indisposition is only a passing one. He is a great authority on Funguses, especially the edible ones, I hope he has not been eating too many. I always think if he had really partaken of all the wonderful edible Funguses that he showed us not very many months ago, the proper award would be really the George Medal. (Laughter.)

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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Part 4

April 1950

THE SECRETARY'S PAGE

ANNOUNCEMENTS—APRIL AND MAY

Shows, Lectures and Meetings

TUESDAY, APRIL 4. 12 NOON TO 7 P.M. First day of Fortnightly Show.

Camellia and Magnolia Competition.

2.30 P.M. First day of Camellia and Magnolia Conference.

WEDNESDAY, APRIL 5. 10 A.M. TO 5 P.M. Second day of Show.

10.30 A.M.) Second day of Camellia and Magnolia Conference.
2.30 P.M.)

THURSDAY, APRIL 13. 12.30 P.M. TO 7 P.M. First day of Daffodil Show.

First day of British National Carnation Society's Spring Show.

3 P.M. LECTURE: *Points of a Good Daffodil and How to stage Daffodils for Exhibition* by MAJOR C. B. HABERSHON.

FRIDAY, APRIL 14. 10 A.M. TO 5 P.M. Second day of Daffodil Show.

Second day of British National Carnation Society's Spring Show.

TUESDAY, APRIL 18. 12 NOON TO 7 P.M. First day of Fortnightly Show.

Sewell Medal Competition for Alpines for Amateurs.

3 P.M. LECTURE: *Architecture in Relation to Gardens* by MR. G. P. YOUNGMAN, A.I.L.A., A.M.T.P.I.

WEDNESDAY, APRIL 19. 10 A.M. TO 5 P.M. Second day of Show.

TUESDAY, APRIL 25. 12 NOON TO 7 P.M. } Alpine Garden

WEDNESDAY, APRIL 26. 10 A.M. TO 5 P.M. } Society's Show.

TUESDAY, MAY 2. 12 NOON TO 7 P.M. First day of Fortnightly Show and of Rhododendron Show.

3 P.M. LECTURE: *The Gardens at Bodnant* by THE PRESIDENT OF THE SOCIETY, THE LORD ABERCONWAY, C.B.E., LL.D., V.M.H.

WEDNESDAY, MAY 3. 10 A.M. TO 5 P.M. Second day of Show and Rhododendron Show.

CHELSEA SHOW

Tuesday, May 23—2 P.M. TO 8 P.M. Private view*

Wednesday, May 24—8.30 A.M. TO 8 P.M.

Thursday, May 25—8.30 A.M. TO 8 P.M.

Friday, May 26—8.30 A.M. TO 5 P.M.

**Note:* This is a Private View for Fellows and Associates. On receipt of his subscription each Fellow and Associate is sent a ticket with a special detachable portion which alone will admit to the Private View.

Lecture—The lecture by MR. G. P. YOUNGMAN on April 18 has been arranged by the National Institute of Landscape Architects in collaboration with our Society. The chair will be taken by the President of the Institute, DR. THOMAS SHARP, M.A., M.T.P.I.

Demonstrations at Wisley—The following demonstrations will be given at Wisley, that on the second day being a repetition of the demonstration given on the first:—

Vegetable Garden

May 10, 11. Thinning, Transplanting and Successional Cropping. (2-4 P.M.)

Flower Garden

May 31, June 1. Summer Pruning of Shrubs. (2-4 P.M.)

Opening of Shows—The Council has decided that as an experiment during the period of summer time this year the Society's Shows shall remain open on the first day of each Fortnightly Show until 7 P.M. This is to give an opportunity of seeing the Show to those Fellows and others living in London who cannot get away from their offices in time to see the Show before 6 P.M. This experiment will be carefully watched to see whether the response is sufficient to justify the same arrangement in future years.

Publications—*New Plants of the Year 1949* should be available early in April. This contains descriptions of all plants which received awards at Vincent Square or after trial at Wisley during 1949 and is illustrated both in colour and in monochrome. It is thought that this volume should be of special value to overseas Fellows and those who are not able to visit the Shows. It may be obtained on application to the Secretary, price 12s. 6d. plus postage and packing 9d. There are still copies available of *New Plants of the Year 1948* and copies of this can be supplied together with the 1949 volume at the inclusive price of £1, postage 1s.

Please give him our very kindest regards, and tell him how very sorry we are that he cannot be here to-day. (Applause.)

Now we have the Veitch Memorial Medals, which are awarded to those who have helped in the advancement and improvement of the science and practice of horticulture.

We award the first to Mr. THOMAS SMITH. Mr. Smith is one of those fine old gardeners who has attained the age of 93. We all know Mr. Smith's Book *The Profitable Culture of Vegetables* which has run into many editions since it first appeared as long ago as 1911. Mr. Smith set it all in type eight pages at a time, he had a cast taken from that which went to the printers, he broke the type up again and then started on another eight pages, and so on. It has been a wonderfully helpful book to generation after generation of gardeners, and we want to commemorate that book by presenting Mr. Smith with the great Veitchian Medal. (Applause.)

The next name on the list is an award to someone who is absent, that is Professor WEN-PEI FANG of the National Szechwan University, a Chinese botanist who has published a work on the vegetation of the mountain, which is so celebrated for the plants that it produces, Mount Omei in China. It is the mountain to which Wilson, the Chinese explorer, first went when he was sent out by Veitch, and he collected a host of beautiful plants there, which many of us, including myself, grow with the greatest pleasure. Professor Fang has explored that mountain again and got further seeds, and he has published a very excellent book called *Icones Plantarum Omeiensium*, which means an account of the plants on Mt. Omei. I said that horticulturists do not quarrel, but rather a nasty quarrel nearly developed, because he sent a copy of his very interesting work addressed to the President of the Royal Horticultural Society, and it was a question between the Librarian and myself whether it was sent to me in my personal capacity or my official capacity. (Laughter.) However, we both had it for a time, and then by making the Professor a present of our *Botanical Magazine*, we secured another copy. (Laughter.) I am quite sure he will appreciate very much the award that the Society is making to him.

Then we have the Associates of Honour :—

Mr. H. J. BROOKS. Mr. Brooks was trained at Kew and has been for most of his life in the West Indies and other parts of the world, dealing with gardening and horticulture most successfully. He has written numerous papers, including one on Ground Nut Cultivation. (Laughter.) However, Mr. Strachey did not read it, he knew better—(laughter)—and instead of appointing a man who knew about his nuts, he appointed someone with quite different qualifications. Mr. Brooks has had a most distinguished career, and though he has not come under our personal observation, by showing plants at any of our meetings, he has done most excellent work for Empire cultivation. (Applause.)

Mr. F. C. BROWN, who has been at Wisley and was appointed our Trials Officer in 1919, and for thirty years has been responsible for the onerous task of keeping the records of plants. Latterly he had been

responsible for the cultivation of our vegetables, including those grown for the Lease-Lend Trials, a very onerous task also. He has for many years acted as the Secretary of two Committees. We have very great pleasure in appointing him an Associate of Honour, and I am glad to hand him the Certificate. (Applause.)

Mr. R. J. DREW, who commencing as an apprentice at the age of 15, has been working for nearly 60 years in various nurseries. For the last 34 years he has been with Alexander Dickson as manager of their Rose Department, during which time he has been responsible for most of their exhibits of Roses, in fact when you talk of Dickson and Roses, you owe a great deal to Mr. Drew, whose efforts have made our Shows and gardens more fragrant and more beautiful. (Applause.)

Mr. R. E. FARMER, also an Associate of Honour; he has been at Dell Park working at Baron Schroeder's Orchid collection. I believe you were there, Mr. Farmer, when Baron Schroeder's collection comprised a very great number of the very finest varieties of every species. I remember seeing that collection in those days and marvelling at the wonderful forms of the old species collected in the wilds, which were so much better than the forms previously found. Then you were also responsible for a great many hybrids, and in all you were a very skilled cultivator for 37 years. (Applause.)

Mr. H. J. HALL, who also by a curious coincidence has been for 37 years employed at one place, at Harewood Hall, where he was appointed by the present owner's grandfather. He has laid out Italian gardens, made new rock gardens, and so he is a landscape gardener as well as a great cultivator. I know what a lovely garden you have made of it, and may it and you continue to prosper. (Applause.)

Mr. R. W. STUDLEY. We now go to parks. Unfortunately, the park of which you have charge, at Portsmouth, was under bombardment when that town suffered. You have, however, been putting it right again. I believe the work is being done extremely well, and the garden will probably be better than it ever was. The exploding of bombs has probably loosened the soil better than double digging would have done, and I am sure under Mr. Studley's care this park will again be a very noteworthy feature in our urban life. (Applause.)

We have now the Loder Rhododendron Cup given by our old friend, Lord Wakehurst, many years ago for work done in connection with Rhododendrons. It has been awarded this year to our friend, Mr. R. L. HARROW, and no one has ever deserved it better. I remember seeing Mr. Harrow at work on his Rhododendrons when Forrest was busy collecting in China, and the seed came in in huge batches; there was Mr. Harrow with pan after pan full of little Rhododendrons. Other explorers sent things, and Mr. Harrow did more to fill our gardens with good Rhododendron species than anyone has ever done. Then he was good enough to come to Wisley and give us most substantial help in planting these Rhododendrons. No one deserves the award of this Cup more than our old friend, Mr. Harrow. (Applause.)

The A. J. Waley Medal, awarded to a professional gardener who has helped the cultivation of Rhododendrons. That has been awarded by the Committee to our friend, Mr. F. E. W. HANGER. (Applause.)

I was first struck by Mr. Hanger, now many years ago, when I went down to pay a visit to Mr. Lionel de Rothschild, and he took me round the greenhouses, and Mr. Hanger had struck a cutting of *Falconeri*, one of those large-leaved Rhododendrons, which no one had ever struck from a cutting before; I have had a most profound admiration for his power of propagating plants ever since I saw that happen. Now we are most fortunate to have him at Wisley, and those of us who look at Wisley, and especially those who go round to Battleston Hill, will see what he has done there. If you go round the frames you will see lots of little Rhododendrons with the mystic letter "H" on them, and those are Mr. Hanger's own hybrids; I expect that some day they will be very fine and indeed will out-rival many of our other Rhododendrons. I do congratulate you, Mr. Hanger, on receiving this Award. (Applause.)

The Lawrence Medal goes to the COMMISSIONERS OF CROWN LANDS for their exhibit of Rhododendrons, Azaleas, and other trees and shrubs. I do not know whether any of you have been to the wonderful land round Virginia Water, and seen what Mr. SAVILL, the recipient of the Honour, has been doing there, it is early days yet, but some idea can be gained as to what can be done by planting that pleasant shrub, the Rhododendron. Mr. Savill is an enthusiast about Rhododendrons, he plants them by the acre in a most wonderful situation; it is beautifully drained, and runs down to that great lake, which is a background for the Rhododendrons, fine species and hybrids, evergreen Azaleas, and all kinds of things that are planted there, and if I may say so, with the very greatest possible taste. That is the secret of the beauty which has come to and will go on increasing on the land round Virginia Water. I hope as many of you as can, in spite of petrol restrictions, will go and see that beautiful garden, and continue to visit it as it grows in size and beauty, because Mr. Savill has done wonderful work there.

But this particular medal is given not for that work, but for the exhibit of Rhododendrons, Azaleas and trees, shrubs and Primulas at Chelsea Show, founded on that work, and on a similar piece which he has taken under his care. It was a most beautiful show at Chelsea, and it gives me very great pleasure to hand this Lawrence Medal to Mr. E. H. SAVILL. (Applause.)

The Holford Medal, given to Mr. EDMUND DE ROTHSCHILD; he is not able to be present, but Mrs. Lionel will take it for him. It was awarded for the best exhibit of plants shown by an amateur during the year in the Society's Halls, for an exhibit of Nerines on October 18. Not only was that a wonderful exhibit, but it showed that that great garden, established by his father, had been kept going, and is still producing those plants for which it has always been famous, if not perhaps in quite the same quantity, at any rate of the same excellence and beauty. Mrs. Lionel de Rothschild is I know very proud of that garden, and of its progress, and will keep a watchful eye on it. (Applause.)

The Williams Memorial Medal, awarded for a group of plants of one genus which show excellence in cultivation. It has been awarded to Messrs. BLACKMORE & LANGDON for their exhibit of Cyclamens on November 29. Mr. Alan Langdon will take the medal on their behalf. It was one of the finest shows of plants we have ever seen in this Hall. It was not only the way you showed those plants, Mr. Langdon, but the fact that it was your genius and the genius of your firm that made those plants. You have taken up several genera, and you have made most wonderful progress in every branch of them. We are very glad to award you the Williams Medal, and congratulate you most sincerely. (Applause.)

The George Moore Medal, awarded for the best new *Cypripedium* shown to the Society during the year. It has been awarded to Messrs. SANDERS for *Cypripedium* 'Crimea', and our old friend, Mr. Fred Sander is here to receive the medal. We have known him for many years, showing his Orchids, and owning and organizing that wonderful Stud Book which bears his name, and which all Orchid owners possess. The *Cypripedium* in question I remember well, a very large and beautifully coloured flower which fully deserves the medal, it is very nice that that medal goes to Mr. Sander and his firm. (Applause.)

Mr. E. A. BOWLES: I have yet another very pleasant little duty to carry out, and I think it is one that has never been done before in this Hall or by this Society. It is to present one of our very important cups and a very important medal to one and the same man, and that man is LORD ABERCONWAY. (Applause.) Most thoroughly does he deserve both of them, the medal is for having shown so beautifully to us and brought to our notice that most fragrant of all Jasmines, *Jasminum polyanthum*, a greenhouse plant which can be grown by anybody who will give it a little protection; I believe the scent will reach up to the house however far the greenhouse is away.

The Cory Cup is a very much prized award, and is for the best hybrid raised and shown to the Society during the year. One of Lord Aberconway's very beautiful Rhododendrons was shown here and eclipsed everything else. I have the greatest pleasure, Lord Aberconway, in handing you these trophies. (Applause.)

The PRESIDENT: Thank you, Mr. Bowles. Perhaps I might say this Jasmine was a very lovely greenhouse Jasmine, and it is just too tender to grow out of doors. It was originally, I believe, brought from China by my old friend, Mr. Lawrence Johnston. It is regrettable that you cannot grow it in most parts of this country out of doors, but its scent will fill a very large greenhouse. The Cup is for a little Rhododendron of my own hybridizing. (Applause.)

Mr. PARK: There are many Fellows of the Royal Horticultural Society who look forward every year with keen anticipation to the privilege of attending our Annual General Meeting, if only to be able to listen to the wit and wisdom of our President. (Applause.) This, the greatest Horticultural Society in the world, is exceedingly fortunate in having a leadership for nineteen years which probably as much as any

other factor has conduced to the international pre-eminence of this Society in its own sphere in the world. We are also extremely fortunate in having such a young President, because we are thereby assured of the continuity of policy for many years to come. (Applause.)

I have very much pleasure in proposing a most hearty Vote of Thanks to our President, Lord Aberconway, for presiding over the meeting this afternoon. (Applause.)

Mr. INGWERSEN: I have also been asked by my professional associates to voice our thanks to Lord Aberconway for his services to the Society, and I have great pleasure in seconding all that my predecessor has said. (Applause.)

The PRESIDENT: Thank you Mr. Park and Mr. Ingwersen, and thank you all my friends, for the reception that you have given to this motion. I shall look forward very much to meeting you all, or as many of you as can get into the Hall, next Spring for a similar meeting. Meanwhile, Good-bye. (Applause.)

(*The proceedings then terminated.*)

GENERAL MEETINGS

NOVEMBER 29, 1949

FLORAL COMMITTEE B—LORD ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and twenty-two other members present.

Awards Recommended:

Silver Banksian Medal

To Messrs. Hillier & Sons, Winchester, for an exhibit of flowering and evergreen shrubs.

To Messrs. D. Stewart & Son Ltd., Ferndown, for an exhibit of evergreen shrubs.

Flora Medal

To Winkfield Manor Nurseries, Ascot, for an exhibit of a rock garden.

Banksian Medal

To Messrs. Burkwood & Skipwith Ltd., Kingston, for an exhibit of evergreen and berried shrubs.

To Mr. Stephen Sims, Draycott, for an exhibit of conifers.

To Mr. F. Street, Woking, for an exhibit of heaths, conifers and other shrubs.

Other Exhibits

Cornus capitata, *Elaeagnus glabra*, exhibited by the Rt. Rev. the Lord Bishop of Truro, Lis Escop, Truro.

Lachenalia pendula, exhibited by Messrs. W. A. Constable Ltd., The Lily Gardens, Tunbridge Wells.

Narcissus Broussonetii, *N. viridiflorus*, exhibited by C. C. Mountfort, Esq., Woodside, Ferndown, Dorset.

Nerine flexuosa, exhibited by B. F. Coleman, Esq., Broomhill, Cranbrook, Kent.

Pteris sp. McL.A.F. 323, exhibited by Lord Aberconway, C.B.E., LL.D., V.M.H., Bodnant, N. Wales.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair and eleven other members present.

Awards Recommended:

Silver-gilt Flora Medal

To Messrs. Stuart Low & Co., Jarvis Brook, for a group of Orchids.

Silver-gilt Banksian Medal

To The Hon. Mrs. George Lane, Ashton Wold, Oundle, Northants, for a group of Cymbidiums and Cypripediums.

To Messrs. Sanders, St. Albans, for a group of Orchids.

Award of Merit

Odontioda 'Gera,' (*Oda* 'Uvalda' × *Oda* 'Pittiae') (votes 7 for, 2 against), from Messrs. Charlesworth & Co. Haywards Heath.

Cypripedium 'Delysia' var. 'Radiance' ('Marmion' × 'Atlantis') (votes 7 for, 0 against), from Messrs. H. G. Alexander, Tetbury, Glos.

JANUARY 10, 1950

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRETT, C.B.E., F.L.S., V.M.H., in the Chair, and eleven other members present.

Exhibit

Cranberries (*Vaccinium Oxycoccus*), from Mr. F. Streeter, V.M.H., Petworth Park Gardens, Petworth, Sussex.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and sixteen other members present.

Awards Recommended:*Award of Merit*

Cypripedium 'Socrates' ('Xantippe' × 'Constance Flory') (votes 14 for, 0 against), from H. W. B. Schroder, Esq., Dell Park, Englefield Green.

Cypripedium 'Desert Sun' var. 'Mrs. Jenny Strauss' ('Golden Emblem' × 'Mrs. Geoffrey Webb') (votes 10 for, 3 against), from R. Strauss, Esq., Stonehurst, Ardingly, Sussex.

Cymbidium 'Verulam' Exbury var. (*Alexanderi* × *Tracyanum*) (votes 10 for, 5 against), from Edmund de Rothschild, Esq., Exbury, Hants.

JANUARY 31, 1950

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and seven other members present.

Narcissus Tazetta.—An Italian *Narcissus*, exhibited by Colonel F. C. Stern as *N. Tazetta elatus* and possessing comparatively small flowers with reflexing white segments and a yellow cup, was identified by Mr. E. A. Bowles as an ordinary *N. Tazetta*, apparently a native of Greece which has been spread by human agency from Spain to Japan.

Iris histrioides var. *sophenensis*.—A small *Iris*, exhibited without name by Miss C. Beck, of Great Amwell, was identified as *I. histrioides* var. *sophenensis*. The four-sided leaves were not yet an inch long; the flower was lavender-purple with a golden ridge down the claw; the falls were veined with purple and white.

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRETT, C.B.E., F.L.S., V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:*Silver Hogg Medal*

To St. John's College, Cambridge, for a Group of Apples and Pears.

Silver-gilt Knightian Medal

To Messrs. Sutton & Sons, Ltd., Reading, for a Group of mixed vegetables.

Hogg Medal

To Messrs. J. Cheal & Sons, Ltd., Crawley, for a Group of Apples and Pears.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and sixteen other members present.

Awards Recommended:*Silver-gilt Banksian Medal*

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Cyclamen.

Silver Flora Medal

To Messrs. Napier, Ltd., Taunton, for an exhibit of Carnations.

To Messrs. Sutton & Sons, Ltd., Reading, for an exhibit of *Primula sinensis*.

Silver Banksian Medal

To Messrs. E. J. Horton & Son, Dunstable, for an exhibit of Cyclamen.

To Messrs. Toogood & Sons, Ltd., Southampton, for an exhibit of *Primula malacoides* 'Pink Delight.'

Flora Medal

To Messrs. W. A. Constable, Ltd., Tunbridge Wells, for an exhibit of Lachenalias Hyacinths, etc.

To Southern Growers Ltd., Groombridge, for an exhibit of Hyacinths.

To Messrs. Turner & Reed, Petersfield, for an exhibit of *Primula malacoides*.

To Messrs. Wakeley Bros. & Co., Ltd., London, for an exhibit of Hyacinths, Daffodils, etc.

Banksian Medal

To Mr. John R. Bell, Cross-in-Hand, for an exhibit of Carnations.

To Messrs. Frank Brown & Son (Whitstable), Ltd., Whitstable, for an exhibit of *Primula malacoides* and Cinerarias.

Selected for trial at Wisley

Primula sinensis, 'Giant Crimson Glow,' *Primula sinensis* 'Giant Pink,' *Primula sinensis* 'Giant Startler,' *Primula sinensis* 'Single Reading Blue,' from Messrs. Sutton & Sons, Ltd., Reading.

Other Exhibits

Primula sinensis stellata 'Blue Shadows' and *Primula sinensis* 'Single Loveliness,' from Messrs. Sutton & Sons, Ltd., Reading.

Primula sinensis in variety, from the Wisley Trials, exhibited by the Director, R.H.S. Gardens, Wisley.

Roses, from Messrs. Wheatcroft Bros., Ltd., Nottingham.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and fourteen other members present.

Awards Recommended:**Silver Lindley Medal**

To Messrs. G. Jackman & Son (Woking Nurseries) Ltd., Woking, for an exhibit of dwarf conifers.

Silver Flora Medal

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of flowering trees and shrubs.

To Mr. F. Street, West End, Woking, for an exhibit of hardy Heaths.

Silver Banksian Medal

To Messrs. J. Cheal & Sons Ltd., Crawley, for an exhibit of flowering trees and shrubs.

To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.

To Messrs. Hillier & Sons, Winchester, for an exhibit of flowering shrubs.

To Messrs. D. Stewart & Sons, Ltd., Ferndown, for an exhibit of flowering shrubs and conifers.

To Winkfield Manor Nurseries, Ascot, for an exhibit of rock garden plants and shrubs.

Flora Medal

To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, for an exhibit of dwarf conifers and alpine plants.

To Messrs. Wm. Wood & Son, Ltd., Taplow, for an exhibit of flowering trees and shrubs.

Banksian Medal

To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of flowering shrubs.

To Kew Topiary Nurseries, Ltd., Richmond, for an exhibit of clipped box trees.

To Messrs. M. Prichard & Sons Ltd., Christchurch, for an exhibit of flowering shrubs and rock garden plants.

Cultural Commendation

To Mr. J. Middleton, of Plant Protection Ltd., Fernhurst, for an exhibit of two specimen pots of *Ceropegia Woodii*.

Other Exhibits

Chimonanthus praecox var. *luteus*, *Hamamelis japonica* var. *flavo-purpurascens*, exhibited by Messrs. R. C. Notcutt, Ltd., Woodbridge.

Hamamelis mollis var. *brevipetala*, exhibited by Messrs. Hillier & Sons, Winchester.

Narcissus Tazetta var. *elatus*, exhibited by Col. F. C. Stern, O.B.E., F.L.S., V.M.H., Highdown, Goring-by-Sea.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and sixteen other members present.

Awards Recommended:*Silver-gilt Banksian Medal*

To Messrs. Sanders, St. Albans, for a group of Orchids.

Silver Flora Medal

To N. M. Jensen, Esq., Woldingham, Surrey, for a group of Cypripediums.

Award of Merit

Cymbidium 'Kairouan' Exbury var. ('Rosanna' × 'Adelma') (votes 9 for, 4 against), from Edmund de Rothschild, Esq., Exbury, Hants.

Odontoglossum 'Jenny Strauss' (*Perryanum* × 'Purple Emperor') (votes 10 for, 2 against), from R. Strauss, Esq., Stonehurst, Ardingly, Sussex.

JOINT ROCK GARDEN PLANT COMMITTEE—Mr. E. B. ANDERSON in the Chair, and eight other members present.

Exhibit

Iris histrioides var. *sophenensis*, from Miss C. Beck, 'The Cottage,' Great Amwell, Ware.

FEBRUARY 14, 1950

FRUIT AND VEGETABLE COMMITTEE—Mr. A. CHEAL, in the Chair, and twenty-six other members present.

Awards Recommended:*Silver-gilt Knightian Medal*

To the National Farmers' Union Market Produce Show Society, Bedford Square, London, for a group of forced Rhubarb.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and twenty-five other members present.

Silver-gilt Flora Medal

To Messrs. Walter Blom & Son, Ltd., Watford, for an exhibit of Daffodils and Hyacinths.

To Messrs. Sutton & Sons, Ltd., Reading, for an exhibit of Primulas.

Silver-gilt Banksian Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.

Silver Flora Medal

To Messrs. Napier, Ltd., Taunton, for an exhibit of Carnations.

Silver Banksian Medal

To Messrs. Barr & Sons, Taplow, for an exhibit of Daffodils, Crocuses, etc.

To Messrs. Dobbie & Co., Ltd., Edinburgh, for an exhibit of Daffodils, Crocuses and Hyacinths.

To Messrs. Toogood & Sons, Ltd., Southampton, for an exhibit of *Primula malacoides* 'Pink Delight.'

To Messrs. Wakeley Bros. & Co., Ltd., Hatfield, for an exhibit of Daffodils, Crocuses, etc.

Flora Medal.

To Messrs. J. Cheal & Sons, Ltd., Crowley, for an exhibit of Blue Primroses, Crocuses, etc.

Banksian Medal

To Mr. John R. Bell, Cross-in-Hand, for an exhibit of Carnations.

To Messrs. Blackmore & Langdon, Bath, for an exhibit of coloured Primroses.

To Messrs. T. Carlike, Ltd., Twyford, for an exhibit of coloured Primroses, Polyanthus and Helleborus.

Award of Merit

To *Freesia* 'Goldcup' as a cool greenhouse plant for cutting and market (votes 19 for, 6 against), from Parigo Horticultural Co., Ltd., Bourne Road, Spalding, Lincs.

Other Exhibits

Freezias 'Blushing Bride' (A.M. 1948), 'Souvenir' (A.M. 1948), 'Snowdrift' from Parigo Horticultural Co., Ltd., Spalding.

Primula malacoides var. from Fred Yule, Esq., Leigh-on-Sea.

Rose 'Happiness' from Messrs. Wheatcroft Bros., Ltd., Nottingham.

FLORAL COMMITTEE B—LORD ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and eighteen other members present.

Awards Recommended:*Gold Medal*

To Lord Leconfield, G.C.V.O., Petworth, for an exhibit of plants raised from the wild form of *Cyclamen persicum*.

Silver Flora Medal

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of flowering trees and shrubs.

To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of flowering trees and shrubs.

Silver Banksian Medal

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of flowering and evergreen shrubs.

To Messrs. Hillier & Son, Winchester, for an exhibit of flowering and evergreen shrubs.

To Messrs. Wm. Wood & Son Ltd., Taplow, for an exhibit of flowering trees and shrubs and bulbous plants.

Flora Medal

To Messrs. W. A. Constable Ltd., Southborough, for an exhibit of *Lachenalias*, Irises, and other bulbous plants.

To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.

To Messrs. W. E. Th. Ingwersen Ltd., East Grinstead, for an exhibit of alpine plants and shrubs.

To Messrs. G. Jackman & Son (Woking Nurseries) Ltd., Woking, for an exhibit of dwarf Conifers.

To Messrs. D. Stewart & Son, Ltd., Ferndown, for an exhibit of flowering shrubs and bulbous plants.

To Messrs. R. Wallace & Co., Tunbridge Wells, for an exhibit of Daffodils, other bulbs, and shrubs.

To Winkfield Manor Nurseries, Ascot, for an exhibit of bulbous and alpine plants and shrubs.

Banksian Medal

To Messrs. Burkwood & Skipwith Ltd., Kingston, for an exhibit of flowering and evergreen shrubs.

To Messrs. G. & A. Clark, Ltd., Dover, for an exhibit of flowering and evergreen shrubs.

To the Kew Topiary Nurseries, Richmond, for an exhibit of clipped Box trees.

To the MacPenny Nurseries, Bransgore, Christchurch, for an exhibit of rock garden plants and shrubs.

To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of flowering shrubs and bulbous plants.

To Messrs. W. H. Rogers & Son, Eastleigh, for an exhibit of dwarf Conifers.

To Mr. F. Street, Woking, for an exhibit of Heaths and other shrubs.

Award of Merit

To *Acer palmatum* var. 'Senkaki' as a hardy, ornamental-barked shrub (votes unanimous, subject to verification of name), from the Sunningdale Nurseries, Windlesham, Surrey.

Other Exhibits

Camellia saluenensis, *Helleborus foetidus*, exhibited by Col. F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Highdown, Goring-by-Sea, Sussex.

Pyracantha atalantioides 'Haslemere Scarlet,' exhibited by Mrs. E. Pawsey, Weyhill, Haslemere.

ORCHID COMMITTEE—MR. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and sixteen other members present.

Awards recommended:

Silver Flora Medal

To Lt.-Col. the Hon. H. S. Tufton, Castle Hill, Englefield Green, Surrey, for a group of Cymbidiums.

To Messrs. Stuart Low & Co., Jarvis Brook, Sussex, for a group of Orchids.

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

Silver Banksian Medal

To Messrs. Sanders, St. Albans, for a group of Orchids.

Award of Merit

Laeliocattleya 'New York' var. 'Atlantic' (C. 'Maggie Raphael' × *Lc.* 'Aconcagua') (votes 12 for, 1 against), from H. W. B. Schroder, Esq., Dell Park, Englefield Green, Surrey.

Cymbidium 'Mayfair,' Castle Hill var. ('Rosy Queen' × 'Edzell') (votes 8 for, 4 against), from Lt.-Col. the Hon. H. S. Tufton, Castle Hill, Englefield Green, Surrey.

Cypripedium 'Vigilant' ('Whitehall' × 'Beaufort') (votes 13 for, 0 against), from Messrs. Stuart Low & Co., Jarvis Brook, Sussex.

Cypripedium 'Failand' ('Ballet Girl' × 'Thebian') (votes 7 for, 0 against), from R. N. Palmer, Esq., Ashlands, Warmley, Bristol.

Odontioda 'Lola' (*Oda.* 'Sapphira' × *Oda.* 'Argia') (votes 7 for, 3 against), from Messrs. Charlesworth & Co., Haywards Heath.

JOINT ROCK GARDEN PLANT COMMITTEE—Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and twelve other members present.

Awards Recommended:

Award of Merit

To *Dionysia bryoides* (P.C. 1944) as a hardy flowering plant for the Alpine House from C. H. Hammer, Esq., The Old Rectory, Boreham, Essex.

Preliminary Commendation

To *Primula juliana* var. 'Blue Horizon' as a hardy flowering plant for the Rock Garden from Six Hills Nursery, Ltd., Stevenage, Herts.

Cultural Commendation

To C. H. Hammer, Esq., The Old Rectory, Boreham, Essex, for a well-grown plant of *Dionysia bryoides*.

Other Exhibits

Cyclamen ibericum (A.M. 1937) from Mrs. D. E. Saunders, "Husseys," Green Street Green, Farnborough, Kent.

Extracts from THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY

GENERAL MEETINGS

MARCH 7, 1950

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and seven other members present.

Galanthus Speciosus.—The Chairman commented on three Snowdrops before the Committee. One without leaves, but possibly a form of *Galanthus nivalis*, sent by Mrs. N. G. Thompson, Escrick, York, was remarkable in that many flower-stems of the clump bore two flowers, like the three specimens exhibited. This unusual habit can be considered a reversion to the more primitive several-flowered habit of *Leucojum*. Another Snowdrop, grown by Mr. Norman Hadden, West Porlock, from bulbs collected on Samos by Mr. P. H. Davis, was recognized as a form at one time distributed by Messrs. G. C. van Tubergen as *G. byzantinus* but now associated with *G. graecus*. It had narrow glaucous twisted leaves and the inner perianth segments were blotched with green in the lower part as well as green-marked at the tip. A large-flowered Snowdrop of the *G. nivalis* group, with glaucous leaves but no basal blotch on the inner perianth-segments, which had been grown at Wisley from bulbs obtained from Miss Poë of Nenagh, Eire, was taken by Dr. W. B. Turrill for further examination. It had been known as *G. caucasicus* but the precise application of that name was obscure.

Holly in Fruit.—Mr. E. H. M. Cox, Glencarse, Perthshire, sent some profusely berried sprays of Holly (*Ilex Aquifolium*) taken off a tree about 30 feet tall, the berries of which seemed to be ignored by birds. In nearly fifty years Mr. Cox had never seen a bird touch the berries, which in February were as profuse as in October, whereas most Hollies in the district were cleared of berries before Christmas. The Committee could suggest no good reason for the immunity of this tree.

Colchicum and Plantago.—A small pink-flowered *Colchicum* with yellow anthers and three narrow rather erect leaves, introduced by Dr. N. H. Rechinger, jun., from Persia and grown at Wisley, was provisionally identified as *Colchicum Scovitsii* or a closely allied species. The perianth-segments were too broad for *C. crocifolium*. The Director of The Royal Horticultural Society's Gardens, Wisley, also exhibited a plantain with small leaves entirely covered, except for a short glabrous apiculus, with long silvery hairs. This had been introduced from Spain by Messrs. Heywood and Davis (H. & D. 142) and was identified as *Plantago nivalis*.

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRETT, C.B.E., F.L.S., V.M.H., in the Chair, and fourteen other members present.

Exhibit

Apple Seedling from H. F. S. Bale, Esq., Hollytop, Greenhayes, Banstead, Surrey.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair and twenty-one other members present.

Awards Recommended:

Silver-gilt Flora Medal

To Messrs. Walter Blom & Son, Ltd., Watford, for an exhibit of Daffodils, Hyacinths, Crocuses, etc.

Silver-gilt Banksian Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.
To Parigo Horticultural Co. Ltd., Spalding, for an exhibit of Freesias.

Silver Flora Medal

To Messrs. Wakeley Bros. & Co. Ltd., North Mymms, for an exhibit of Daffodils, Tulips, Crocuses, etc.

Silver Banksian Medal

To Messrs. R. H. Bath, Ltd., Wisbech, for an exhibit of Freesias.
To Messrs. R. Wallace & Co., Tunbridge Wells, for an exhibit of Daffodils and other bulbous plants.

Flora Medal

To Messrs. Barr & Sons, Taplow, for an exhibit of Daffodils, Helleborus and other hardy plants.

To Mr. John R. Bell, Cross-in-Hand, for an exhibit of Carnations.

To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of coloured Primroses.

To Southern Growers, Groombridge, for an exhibit of Daffodils, Tulips, Crocuses, etc.

Banksian Medal

To Messrs. Blackmore & Langdon, Bath, for an exhibit of coloured Primroses and Polyanthus.

To Messrs. Frank Brown & Son (Whitstable) Ltd., Whitstable, for an exhibit of Cinerarias and Cyclamen.

To Messrs. B. R. Cant & Sons, Ltd., Colchester, for an exhibit of Roses.

Other Exhibits

Anemones and coloured Primroses from Mr. C. Newberry, Knebworth.

FLORAL COMMITTEE B—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and nineteen other members present.

Awards Recommended:

Silver-gilt Banksian Medal

To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of flowering trees and shrubs.

Silver Flora Medal

To Messrs. Hillier & Sons, Winchester, for an exhibit of flowering trees and shrubs.

To Six Hills Nursery, Stevenage, for an exhibit of Primulas and Saxifrages.

To Mr. F. Street, Woking, for an exhibit of Heaths and other flowering shrubs.

To Waterperry Horticultural School, Oxford, for an exhibit of Saxifrages and other rock garden plants.

Silver Banksian Medal

To Messrs. G. & A. Clark, Dover, for an exhibit of flowering trees and shrubs, and Primulas.

To Messrs. Haskins Bros., Bournemouth, for an exhibit of flowering shrubs.

To Messrs. W. E. Th. Ingwersen Ltd., East Grinstead, for an exhibit of alpine plants.

To Messrs. D. Stewart & Son, Ltd., Ferndown, for an exhibit of flowering shrubs and bulbous plants.

To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of bulbous and rock garden plants.

To Messrs. Wm. Wood & Son Ltd., Taplow, for an exhibit of flowering trees and shrubs.

Flora Medal

To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of flowering trees and shrubs.

To Messrs. J. Cheal & Sons, Crawley, for an exhibit of flowering trees and shrubs.

To Messrs. W. A. Constable, Ltd., Southborough, for an exhibit of bulbous plants.

To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.

To Mr. M. P. Kooper, Ferndown, for an exhibit of flowering shrubs and rock garden plants.

To MacPenny Nurseries, Bransgore, for an exhibit of flowering shrubs and rock garden plants.

To the Old Welwyn Gardens, Welwyn By-Pass, Herts., for an exhibit of Saxifrages and other rock garden plants.

To Messrs. M. Prichard & Son, Ltd., Christchurch, for an exhibit of rock garden plants and shrubs.

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of flowering trees and shrubs.

To Messrs. Sale & Son, Wokingham, for an exhibit of flowering trees and shrubs.

To Winkfield Manor Nurseries, Ascot, for an exhibit of rock garden plants.

Banksian Medal

To Lt.-Col. L. H. Brammall, Salisbury, for an exhibit of rock garden plants.

To Messrs. W. H. Rogers, Ltd., Eastleigh, for an exhibit of flowering shrubs.

To Messrs. Ryder & Son, Ltd., St. Albans, for an exhibit of Azaleas.

To Messrs. E. J. Woodman & Sons, Pinner, for an exhibit of conifers.

Award of Merit

To *Camellia japonica* 'Anemoniflora' as a hardy flowering shrub, subject to verification of name, (votes 17 for, 0 against), from Sir Giles Loder, Bt., Leonardslee, Horsham.
 To *Hippeastrum rutitum* var. *fulgidum* as a flowering plant for the cool greenhouse (votes 14 for, 0 against), from the Director, R.H.S. Gardens, Wisley.

To *Salvia gesneraeflora* as a flowering plant for the cool greenhouse (votes 11 for, 5 against), from P. M. Syngé, Esq., Clare Cottage, West Byfleet, Surrey.

Other Exhibits

Camellia Donckelaarii, exhibited by the Misses Godman, South Lodge, Horsham.

Primula Juliana 'Blue Horizon', exhibited by Six Hill Nursery, Ltd., Stevenage.

Veltheimia viridifolia, exhibited by the Director, Royal Botanic Gardens, Kew.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and thirteen other members present.

Awards Recommended:*Gold Medal*

To H. W. B. Schroder, Esq., 'The Dell Park, Englefield Green, for a superb group of richly-coloured *Cymbidiums*.

Silver-gilt Banksian Medal

To Messrs. Stuart Low & Co., Jarvis Brook, for a group of Orchids.

Silver Flora Medal

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

First-Class Certificate

Cymbidium 'Miretta' var. 'Memoria A. A. McBean' ('Mirabel' × 'Claudette') (votes 11 for, 1 against), from McBean's Orchids, Ltd., Cooksbridge.

Award of Merit

Laeliocattleya 'Mullion' var. 'Springtime' (C. 'Atlantic' × Lc. 'Hyperion') (votes 9 for, 3 against), from Messrs. Stuart Low & Co., Jarvis Brook.

Cymbidium 'Princess Elizabeth' var. 'St. Andre' (*Alexanderi* × 'Princess Astrid') (votes 12 for, 0 against), from Lt.-Col. the Hon. H. S. Tufton, Castle Hill, Englefield Green.

Preliminary Certificate

Odontoglossum 'Aldonia' var. 'Colossus' ('Alperor' × 'Tordonia') (votes 10 for, 2 against), from Messrs. Charlesworth & Co., Haywards Heath.

Cultural Commendation

To Mr. E. Bartlett, Orchid grower to Major Edmund de Rothschild, Exbury, for a vigorous plant of *Cymbidium* 'Imogen' Exbury var.

NARCISSUS AND TULIP COMMITTEE—Mr. E. A. BOWLES, F.L.S., F.R.E.S., V.M.H., in the Chair, and ten other members present.

Awards Recommended:*Silver-gilt Banksian Medal*

To Messrs. Dobbie & Co., Ltd., Edinburgh, for an exhibit of Daffodils and Tulips.

Silver Flora Medal

To Messrs. The Trenoweth Valley Flower Farm, Ltd., St. Keverne, Cornwall, for an exhibit of Daffodils.

Silver Banksian Medal

To Messrs. J. R. Pearson & Son, Ltd., Lowdham, Notts., for an exhibit of Daffodils and Tulips.

Flora Medal

To Messrs. Barr & Sons, 11-13 King Street, Covent Garden, London, W.C.2, for an exhibit of Daffodils.

To Messrs. R. H. Bath, Ltd., Wisbech, Cambs., for an exhibit of Daffodils.

To Mr. Raymond Perks, Berrow, Burnham-on-Sea, Somerset, for an exhibit of Daffodils.

Daffodil selected for trial

Narcissus 'Firework' sent by G. H. Johnstone, Esq., O.B.E., was selected for trial as a variety for garden decoration.

JOINT ROCK GARDEN PLANT COMMITTEE—Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and nine other members present.

Awards Recommended:

Award of Merit

To *Primula* 'Bractworth' (*P. bracteosa* × *P. Edgeworthii*) (P.C. 1949) as a hardy flowering plant for the Alpine House, from Mrs. D. E. Saunders, Husseys, Green Street Green, Farnborough, Kent.

Cultural Commendation

To Mrs. D. E. Saunders, Husseys, Green Street Green, Farnborough, Kent, for particularly fine plant of *Primula* 'Bractworth.'

Other Exhibit

Scilla bifolia var., from Gerald K. Mooney, Esq., Southmead, Sevenoaks Weald, Kent.

MARCH 21, 1950

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRET, C.B.E., F.L.S., V.M.H., in the Chair, and fifteen other members present.

Exhibits

Apple seedling from Mr. R. D. Smith, The Gardens, Weston Hall, Shifnal, Shropshire.
Apple seedling from Mr. S. L. Lord, Shenley Hospital, nr. St. Albans, Herts.

FLORAL COMMITTEE A Mr. D. CAMPBELL, M.B.E., in the Chair, and nineteen other members present.

Awards Recommended:

Silver-gilt Flora Medal

To Parigo Horticultural Co., Ltd., Spalding, for an exhibit of Freesias.

Silver-gilt Banksian Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.

Silver Flora Medal

To Messrs. Wakeley Bros. & Co., Ltd., North Mymms, for an exhibit of Daffodils, Tulips, Crocuses.

Silver Banksian Medal

To Southern Growers, Ltd., Groombridge, for an exhibit of Daffodils, Tulips, Crocuses.

Flora Medal

To Messrs. Blackmore & Langdon, Bath, for an exhibit of coloured Polyanthus and Primroses.

To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of coloured Primroses.

Banksian Medal

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of Polyanthus, Blue Primroses and other hardy plants.

Other Exhibits

Anemones and double Primroses from Mr. C. Newberry, Knebworth.

Freesia 'Orange Nassau' (A.M. 1948 after trial at Wisley) from Parigo Horticultural Co., Ltd., Spalding.

Pansy garden from Mr. J. W. Read, Hockley.

Roses from Messrs. B. R. Cant & Sons, Ltd., Colchester.

Violas and Chionodoxas from Mr. C. A. Jardine, Feltham.

FLORAL COMMITTEE B—Mr. J. L. RUSSELL, in the Chair, and nineteen other members present.

Awards Recommended:

Silver-gilt Banksian Medal

To Messrs. Hillier & Sons, Winchester, for an exhibit of flowering trees and shrubs.
To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of flowering trees and shrubs.

Silver Flora Medal

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of flowering trees and shrubs.

Silver Banksian Medal

To Messrs. G. & A. Clark, Ltd., Dover, for an exhibit of Rhododendrons and other flowering shrubs and trees.

To Messrs. Sale & Son, Ltd., Wokingham, for an exhibit of flowering trees and shrubs.

To Messrs. D. Stewart & Son Ltd., Ferndown, for an exhibit of flowering shrubs, Tulips and rock garden plants.

To Mr. F. Street, Woking, for an exhibit of hardy Heaths and other flowering shrubs.

To Messrs. J. Waterer, Sons & Crisp, Ltd., for an exhibit of rock garden plants

Flora Medal

To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of flowering trees and shrubs.

To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.

To Messrs. Haskins Bros., Ltd., Bournemouth, for an exhibit of Camellias and other flowering shrubs.

To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, for an exhibit of rock garden plants.

To Six Hills Nursery, Stevenage, for an exhibit of Primulas and Saxifrages.

To Winkfield Manor Nursery, Ascot, for an exhibit of rock garden plants.

Banksian Medal

To Mr. M. P. Kooper, Ferndown, for an exhibit of flowering shrubs, Narcissi, and rock garden plants.

To Old Welwyn Gardens, Welwyn By-pass, for an exhibit of Saxifrages and other rock garden plants.

To Messrs. M. Prichard & Son, Ltd., Christchurch, for an exhibit of rock garden plants and shrubs.

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of flowering trees and shrubs.

To Messrs. Ryder & Son, Ltd., St. Albans, for an exhibit of Azaleas and rock garden plants.

Other Exhibits

Callistemon citrinus splendens, exhibited by H. L. Baxendale, Esq., Chidham, Chichester.

Camellia japonica varieties, exhibited by Mrs. Guy Harben, Totton.

Clipped Box trees, exhibited by the Kew Topiary Nursery, Ltd., Richmond

Conifers and flowering shrubs, exhibited by Messrs. Woodman, Pinner.

Pæonia Cambessedesii, exhibited by Mrs. R. P. Campbell, Foxrock.

Reinhardtia trigyna, exhibited by the Director, R.H.S. Gardens, Wisley.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and fourteen other members present.

Awards Recommended:

The McBean Memorial Trophy for Cymbidiums

To Edmund de Rothschild, Esq., Exbury, Hants.

Gold Medal

To Edmund de Rothschild, Esq., Exbury, Hants., for a group of Cymbidiums.

To Messrs. Sanders, St. Albans, for a group of Cymbidiums.

Silver-gilt Banksian Medal

To Messrs. Stuart Low & Co., Jarvis Brook, for a group of Orchids.

Silver Flora Medal

To the City of Nottingham Parks Department, for a group of Cymbidiums.

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

To John Moulson, Esq., Horton Green, Bradford, for a group of Cymbidiums

To Sir William Cooke, Bart., Newbury, Berks., for a group of Cymbidiums.

To McBean's Orchids, Ltd., Cooksbridge, for a group of Orchids.

First-Class Certificate

To *Cymbidium* 'Claudona' ('Claudette' \times 'Cremona') (votes 10 for, 2 against), from McBean's Orchids, Ltd., Cooksbridge.

To *Cymbidium* 'Pearlette' ('Janette' \times 'Pearl') (votes 10 for, 3 against), from McBean's Orchids, Ltd., Cooksbridge.

To *Cymbidium* 'Roszika' ('Adriaco' \times 'Rosanna') (votes 12 for, 0 against), from Edmund de Rothschild, Esq., Exbury, Hants.

To *Cymbidium* 'Louis Sander' var. 'Ulysses' (*Alexanderi* \times 'Ceres') (votes 8 for, 4 against), from Messrs. Sanders, St. Albans.

To *Dendrobium* 'Winifred Fortesque' ('Gatton Monarch' \times 'Lady Colman') (votes 14 for, 0 against), from R. Strauss, Esq., Stonehurst, Ardingly, Sussex.

To *Sophrolaeliocattleya* 'Trizac' var. 'Purple Queen' (*C. Trianae* \times *Slc.* 'Anzac') (votes 12 for, 0 against), from Messrs. Armstrong & Brown, Tunbridge Wells.

Preliminary Certificate

To *Cymbidium* 'Lady Moxham' var. 'Amber' ('Sunrise' \times 'Ceres') (votes 10 for 0 against), from Messrs. Sanders, St. Albans.

Cultural Commendation

To Mr. J. W. Blowers, Orchid grower to the Hon. Mrs. Ionides, Buxted Park, Sussex, for *Dendrobium delicatum album*, a well-grown plant bearing seventeen many-flowered spikes.

NARCISSUS AND TULIP COMMITTEE—Mr. E. A. BOWLES, F.L.S., F.R.E.S., V.M.H., in the Chair, and twenty-three other members present.

Awards Recommended:

Gold Medal

To Messrs. Sutton & Sons, Ltd., Reading, for an exhibit of Tulips.

Silver-gilt Flora Medal

To Messrs. Walter Blom & Son, Ltd., Watford, for an exhibit of Tulips.

To Mr. W. J. Dunlop, Ballymena, Northern Ireland, for an exhibit of Daffodils.

To Mr. J. L. Richardson, Waterford, Eire, for an exhibit of Daffodils.

Silver-gilt Banksian Medal

To Messrs. Barr & Sons, 11-13, King Street, Covent Garden, London, W.C.2, for an exhibit of Daffodils.

To Messrs. The Trenoweth Valley Flower Farm, Ltd., St. Keverne, Cornwall, for an exhibit of Daffodils.

Silver Flora Medal

To Mr. Alec Gray, Treswithian Daffodil Farm, Camborne, Cornwall, for an exhibit of Daffodils.

To G. H. Johnstone, Esq., O.B.E., Trewithen, Grampound Road, Cornwall, for an exhibit of Daffodils.

To Mr. Raymond Perks, Berrow, Burnham-on-Sea, Somerset, for an exhibit of Daffodils.

To Major J. O. Sherrard, Shaw, Newbury, Berks., for an exhibit of Daffodils.

Silver Banksian Medal

To Messrs. Partridge & Lower, Starcross, Devon, for an exhibit of Daffodils.

To Messrs. R. W. Wallace & Co., Tunbridge Wells, Kent, for an exhibit of Daffodils.

Award of Merit

To *Narcissus* 'St. Keverne' as a variety for exhibition (voting unanimous). Raised and shown by M. P. Williams, Esq., Lanarth, St. Keverne, Cornwall.

Daffodils selected for trial

The following Daffodils were selected for trial at Wisley as varieties for garden decoration:

Narcissus 'Greenshank' and *N.* 'Snipe,' shown by Mrs. McConnell, Knockdolian, Girvan, Ayrshire.

Narcissus 'General Smuts,' shown by Mr. Peter Lower, Starcross, Devon.

Other Exhibits

Daffodils shown by Mr. Guy L. Wilson, The Knockan, Broughshane, Co. Antrim, Northern Ireland.

Selected forms of *Narcissus Bulbocodium* from Portugal. Shown by C. Ingram, Esq., Benenden, Kent.

An early-flowering seedling Daffodil, shown by the Countess Grey, Howick, Alnwick, Northumberland.

DONATIONS TO THE SOCIETY'S GARDENS AT WISLEY, 1949

ABERCONWAY, Lord, Bodnant; plants, seeds and corms. ADAMS, R., Wisley; seeds. ADAMS, Mrs. S. E., Hawkeville; seeds. ADELAIDE BOTANIC GARDEN, S. Australia; seeds. AHRENDT, Rev. L. W. A., Banbury; seeds. ALLMAN, Mrs. A. H., Cheshire; seeds. ALLWOOD, Messrs., Haywards Heath; plants. ANDERSON, E. B., Rickmansworth; seeds. ANDERSON, Miss I. M. J., Healesville, Australia; seeds. ANLEY, Mrs. G., Woking; seeds, plants and corms. APPLETON, H. A. S., Ruialip; plant. ATKINSON, Miss E. M., St. Davids; seeds. AYYANGAR, Dr. G., Banbury; plants. BALFOUR, A. P., Slough; seeds. BARNLEY, A. W., Kitale, Kenya; seeds. BASEL BOTANIC GARDEN; seeds. BASSETT, H. G., Reigate; plant. BEDFORD, Miss W. E., London, S.W. 11; seeds. BELDERSON, W. J., Enfield; seeds. BENJAMIN, H. J., Epsom; seeds. BENSON, C. E., Rickmansworth; seeds and bulbs. BENTLEY, W., Newbury; seeds, plants and bulbs. BERGEN BOTANIC GARDEN; seeds. BERRY, G. H., Enfield; plants. BESTOBER BOTANIC GARDEN; seeds. BISHOP, Miss K., Sittingbourne; seeds. BLACKMAN, Prof. G. E., Oxford; seeds. BOSCAWEN, Capt. J. P. T., West Clandon; plants. BRITTON, E. A., Tiverton; plants. BROCK, C. L., Maldon; plants. BROWN, J. J., Westcliffe-on-Sea; bulbs. BROWN, J. W. F., Welwyn Garden City; seeds. BUDAPEST

BOTANIC GARDEN; seeds. BURPPE, Messrs. W. Atlee, Philadelphia; seeds. BURTON-BALDING, Mrs. F. A., Streatley; bulbs. BURTT, P. A., Llanfair; seeds. BUXTON, Prof. P. A., Gerrards Cross; seeds. CADNEY, Mrs. G. J., New Barnet; seeds. CAMBRIDGE BOTANIC GARDEN; seeds. CARLILE, Messrs. T., Twyford; plants. CANBERRA RESEARCH STATION; seeds. CHAMBERLAIN, W. S., Hampton; seeds. CHELSEA PHYSIC GARDEN; plants. CHURCHER, M., Endeless, Kenya; seed. CLARK, W., Southport; coriins. CLARKE, Miss E. M., Bexhill-on-Sea; seeds. CLARKE, L. V., Morden; seeds. CLAY, J. H., Winchmore Hill; seeds. CLAY, S., Bristol; seeds. COLCHESTER PARKS DEPARTMENT; plants. COMMISSIONERS FOR CROWN LANDS, Windsor; plants. COMPTON, Prof. R. H., Kirstenbosch; plants. CONSTABLE, Messrs. W. A., Tunbridge Wells; bulbs. COOK, W. D., Gisborne; seeds. COOKE, Capt. Dunne, Soho Square; bulbs. CORKER, H., Pallanza; seeds. COUTTS, J., Woking; plants. COWAN, Dr. J. M., Edinburgh; plants. CRICHTON-MAITLAND, Mrs. A. M., Bourne; seeds. DANKS, F. M., Canterbury, Australia; seeds. DARROCK, M. S., Newquay; seeds. DARMSTADT BOTANIC GARDENS, Germany; seeds. DAVIS, Col. W. E., Camberley; plant. DAY, Miss E. A., Haslemere; cuttings. DAY, Miss F., Walthamstow; seeds. DICKENSON, Mrs. J., Rusopi, S. Rhodesia; seeds. DORRIEN SMITH, Major A. A., Tresco Abbey; seeds. DOWTY, G. H., Haslemere; plant. DOWNES, A. C., Tadworth; seeds. DURRINGTON, A. E., Bexleyheath; seeds. DYKES, P., Wisley; plants. EDINBURGH BOTANIC GARDENS; seeds. EDWARDS, W. G., Texas; seeds. ENGLISH, C. S., Seattle; seeds. EVANS, Miss I., Fordingbridge; seeds. EVERETT, Dr. T. H., New York; plants. FARMAR, H., Kew; bulbs. FINCH, J. R., Bailey, N. Carolina; seeds. FORSTER, W. A., St. Ives; cuttings. FOX, R. J., Rochford; seeds. FRANKFURT-AM-MAIN BOTANIC GARDEN; seeds. FRIKART, C., Zurich; seeds. FURNISS, G. B., Oakland, Calif.; seeds. GERNAT, E. C., Gembrook, Australia; seeds. GENEVA BOTANIC GARDEN; seeds. GIBBS, Mrs. E., Winchester; seeds. GIBBARD, Mrs. T. H., Esher; seeds. GILLILAND, Comdr. F., Londonderry; plants. GLASGOW BOTANIC GARDEN; seeds. GLASNEVIN BOTANIC GARDENS; seeds. GODFREY, W. H., Whitstable; seeds. GOEMANS, J., Spalding; seeds. GOODEY, T., Harpenden; seeds. GOODWIN, A. R., Bewdley; plants. GOTEBOURG BOTANIC GARDEN; seeds. GOULTON, E. C., Swanley; seeds. GOWRIE, Rt. Hon. Countess of, Windsor; seeds. GRACE, G. D., Oregon; seeds. GRAHAM, Mrs. M. A., Surbiton; plants. GRAY, A., Camborne; bulbs. GRAY, Mrs. I. N., Isle of Mull; plants. GRAVETT, W., S. Harrow; seeds. GREGORY, Messrs. C., Nottingham; plants. GURNEY, Lady, Bradford-on-Avon; seeds. HADDEN, N. G., Porlock; seeds. HALL, Mrs. Z., Dublin; seeds. HALLIDAY, Mrs. W., Stanmore; seeds. HARDS, A. K., Nigel, S. Africa; seeds. HARROW, R. L., Godalming; seeds. HARVEY, D., Birmingham; seeds. HAZLEWOOD, Messrs., Epping, Australia; plants. HELSINKI BOTANIC GARDENS; seeds. HENDERSON, Mrs. M. L. S., Buenos Aires; seeds. HENRY, Mrs. N., Gladwyne, U.S.A.; seeds, plants and bulbs. HERBERT, W. T., Bournemouth; seeds. HERKLOTS, Dr. G. A. C., Colonial Office; seeds. HIGGINS, Mrs. V., Croydon; seeds. HILL, Major P. W., Nottingham; seeds. HILLING, Messrs. T., Chobham; plants. HILTON, C. T., Port Alberni, British Columbia; seeds. HOBART HOUGHTON, B. G., Grahamstown, S. Africa; seeds. HOLDER, R. Wisley; plants. HONY, Miss, Woodborough; seeds. HORSFALL, Miss B., Pangbourne; seeds. HOTBLACK, H. S., Cuckfield; seeds. HUTCHINSON, Dr. J. Kew; seeds. HUXTABLE, J., S. Moulton; seeds. HYLTON-FOSTER, Mrs. M., Dorking; plants. IBBOTSON, W. B., Thames Ditton; plants and seeds. ILSLEY, L. G., Bognor Regis; seeds. INGRAM, Capt. C., Benenden; seeds and plants. INOWERSEN, W. E. Th., E. Grinstead; plants. JACKMAN, Messrs. G., Woking; plants. JANAKI, Dr. E. K., Wisley; plants. JEFFERY, Mrs. V., Rugby; seeds. JOHNSON, A. T., Conway; plant. JOHNSON, W. G., Angmering; seeds. JUDSON, G. A., Blackheath; seeds. KEW, ROYAL BOTANIC GARDENS; seeds. KIRSTENBOSCH BOTANIC GARDEN; seeds. KNOX FINLAY, Major W. G., Methven; seeds. KNAP HILL NURSERIES LTD., Woking; plants. LANE, W. A. P., Angmering; seeds. LAURENSEN, J. B., Nelson, New Zealand; plants. LAUSANNE BOTANIC GARDEN; seeds. LAVENDER, W. L., Raynes Park; cuttings. LAWRENCE, Iris, Lady, Wood Street; cuttings. LAWRENCE, W. J. C., Merton; seeds. LEE, W., Forinby; seeds. LE GRICE, Messrs. E. B., North Walsham; plants. LEICESTER PARKS DEPARTMENT; plants. LEIDEN BOTANIC GARDEN; seeds. LETHRIDGE, Mrs. K. L., Frome; plants. LINDLEY, E. S., Wootton-under-Edge; seeds. LINZ BOTANIC GARDEN; seeds. LISBON BOTANIC GARDEN; seeds. LONG, F. R., Johannesburg; seeds and coriins. LONDONDERRY, Marchioness of, Newtownards; seeds and plants. LOWNE, B. T., Worthing; seeds. LOWNDES, D. G., Ringwood; seeds and plants. LOTHIAN, T. R. N., Adelaide; seeds. LOVELOCK, Miss F. E., Edmonton; seeds. LYON BOTANIC GARDEN; seeds. LYSTER, Miss M. A., Arreton; plants. MALLPRESS, H. W., Welwyn Garden City; seeds. MANCHESTER UNIVERSITY BOTANICAL DEPARTMENT; seeds. MARRIAGE, Mrs. G. R., Colorado Springs; seeds. MARRIOTT, Miss E. L., Cirencester; plant. MARSH, R. T., Kings Langley; seeds. MARTIN, D., Hobart, Tasmania; seeds. MARTIN-TOMSON, W. J., Broadstairs; seeds. MAWDSLEY, H., Southport; seeds. MCINTEE, P., Beaulieu; seeds. MEASHAM, R. J. R., North Berwick; seeds. MEYER, F. G., St. Louis; seeds.

MIDDLETON, Admiral G. B., Chatham; cuttings. MILAN BOTANIC GARDEN; seeds. MILNER, Sir W., Appletreewick; seeds. MOLYNEUX, T. G., Sherbrooke, Australia; seeds. MONTGOMERIE, Dr. J., Bath; seeds. MONTREAL BOTANIC GARDEN; seeds. MONTROSE, Duchess of, Drymen; plants and cuttings. MORDAN, Mrs. M. R., Reigate; seeds. MORGAN, D., Treherbert; seeds. MORTON, Earl of, Churt; seeds. MULLIGAN, B. O., Seattle; seeds. MUNCH, Mrs. R., Rusapi, S. Rhodesia; seeds. MÜNCHEN BOTANIC GARDEN; seeds. MUNDEY, G. R., Henley-on-Thames; seeds and plants. MUSGRAVE, Mrs. M. I., Ardingly; seeds. NASH, A. C., Hastings; seeds. NEALE, S., Pembroke; seeds. NEEDHAM, C. L., Masterton, New Zealand; seeds. NELSON, Mrs. E. L., Orick, California; seeds. NEW YORK BOTANIC GARDEN; seeds. NEWMAN, T., London, S.W. 3; seeds. NEWMAN, W., Stroud; seeds. NOLBANDOV, S., Lewes; seeds. NORTON, R., Caterham-on-the-Hill; seeds. NUTT, F. G., Liphook; seeds. ORTON, Miss F., Worthing; seeds. OXFORD BOTANIC GARDEN; corms. PAM, Major A., Wormleybury; seeds, plants and bulbs. PANNELL, F., E. Liss; seeds. PARIS, NATURAL HISTORY SOCIETY; seeds. PEACE, Dr. T. R., Farnham; seeds. PEER, R. S., Los Angeles, California; plants. PEMBERTON, W., Morden Park; plants. PENNELL, J., Kingston Hill; seeds. PENN-GASKELL, Major W., Beaulieu; plant. PERCY-LANCASTER, S., Calcutta; bulbs and seeds. PIKE, A. V., Tresco Abbey Gardens; plants and seeds. POE, Miss B., Nenagh; plants. PRAGUE BOTANIC GARDEN; seeds. PROCTOR, G., Crowborough; seeds. RAFFILL, C. P., Kew; seeds. RATHBONE, Miss M., Ashford; corms and seeds. READER, T. H., Hawera, New Zealand; seeds. RENNES BOTANIC GARDEN; seeds. RHIND, Mrs. G., Alveston; plants. RIALI, Major M., Broadstone; seeds. RIDING, J., Hockley; plants. ROBINSON, Miss G. K., Fareham; plants. ROCKWOOD, N., Chiddingfold; seeds. ROSSE, Earl of, Doncaster; seeds. RUSSELL, Messrs. L. R., Windlesham; plants. ST. ANDREWS BOTANIC GARDEN; seeds. ST. GALLEN BOTANIC GARDEN, Switzerland; seeds. SELIGMAN, Dr. R., Wimbledon; seeds and plants. SANDERSON, Rev. F., Dorking; seeds and plants. SAUNDERS, Mrs. C. B., Farnborough; plants. SAUNDERS, P. G., Sanderstead; seeds. SAWYER, Mrs. M. T., Poolewe; plants. SCASE, R., Wisley; plants. SCOTT, E., Ashford; seeds. SEDGELEY, F. V., New Malden seeds. SHERRARD, Major J. O., Newbury; plants. SIMMONDS, A., Clandon; seeds and bulbs. SIMMONDS, Messrs. E. C., St. Albans; plants. SKINNER, S. A., Crowthorne; seeds. SLADEN, W. J. L., Esher; seeds and plants. SLOCOCK, Messrs. W. C., Woking; plants. SMITH, W. R. N., Woodhall Spa; seeds. SOFIA BOTANIC GARDENS; seeds. SOPPER, Lt.-Col. F. W., Gotherlee; seeds. STARKEY, Miss G. M., Port Isaac; bulb. STERN, Col. F. C., Goring-by-Sea; seeds. STEARN, W. T., Kew; seeds and bulbs. STEVENS, Miss K. M., Crawley; seeds. STEVENSON, J. B., Ascot; plants. STOKER, Mrs. F., Loughton; plant. STOPES, Miss, Southwold; seeds. STOPFORD, Mrs. R. N., Fareham; bulbs. STREET, F., Woking; plants. STREETER, F., Petworth; seeds. SUTTON, Messrs., Reading; seeds. SYNGE, P., Byfleet; plant and seeds. TABOR BOTANIC GARDEN, Czechoslovakia; seeds. TALBOT, G. M., Penzance; seeds. TASMANIA, Governor of, Hobart; seeds. TAYLOR, Dr. G., S. Kensington; seeds. TAYLOR, T. V., York; seeds. TAYLOR, R. H., Avondale, New Zealand; seeds. THORNEYCROFT, Mrs. B. C., Bembridge; seeds. TOLEMAN, E. E., Gibraltar; seeds. TORINO BOTANIC GARDEN; seeds. TORBOCK, H. Cornish, Penrith; seeds. TOYNBEE, Messrs. F., Barnham; plants. TROTTER, R. D., Ockley; bulbs, plants, seeds and cuttings. TROUP, Capt. R. D. R., Dorchester; seeds. UNDERWOOD, Lt.-Col. E., Henley-on-Thames; seeds. UNDERWOOD, Messrs., Woking; plants. UPPSALA BOTANIC GARDEN; seeds. VARGAS, C., Cuzco, Peru; seeds. VIENNA BOTANIC GARDENS; seeds. VILMORIN-ANDRIEUX, Messrs., Paris; seeds. VOLLMER, Dr. A. M., San Francisco; seeds. WACHER, Dr. H. S., Canterbury; plants and seeds. WAGENINGEN BOTANIC GARDEN; seeds. WALEY, F. R., Sevenoaks; seeds. WALL, J. T., Hamilton; plants. WALLACE, Messrs. R., Tunbridge Wells; bulbs. WALLUR, A. D., Neston; seeds. WALPOLE, E. H., Dublin; plants. WARD, J., Wanstead; seeds. WASHINGTON UNIVERSITY ARBORETUM; seeds. WATERHOUSE, E. G., Gordon, Australia; cuttings. WATERPERRY HORTICULTURAL SCHOOL, Oxford; plants. WATTS, W. A., St. Asaph; seeds. WATTS-WILLIAMS, Mrs. M., Nakuru, Kenya; seeds. WALLENSIEK, Prof. S. J., Wageningen; seeds. WETTERN, H. L., Oxted; seeds. WHITE, A., Lancaster; seeds. WHITTAKER, J., London, W.C. 1; seeds. WIESNER, Dr. B. P., London, W. 1; seeds. WILLIAMS, R. J., Port Dinorwic; bulbs, seeds and cuttings. WILLIAMSON, Mrs. K. H., Aberdeen; plants and seeds. WILSON, Miss E., Sheffield; plants. WILSON, W. J., Aston Tirrold; seeds. WILSON, W. J., New Plymouth, New Zealand; seeds. WISCHHUSEN, S. A., Wembley; seeds. WOLSEY, Mrs. N., Lowestoft; seeds. WOOD, Miss M. E., Cromer; seeds. YONGE, Mrs. I. S., Yealmpton; seeds. YOUNG, Messrs. J. B. & F. W., Coleraine; seeds. ZAGREB BOTANIC GARDEN; seeds.

Extracts from THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY

GENERAL MEETINGS

MARCH 21, 1950

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and eleven other members present.

Gall-like growths on Forsythia—Mr. A. Cheal sent shoots of Forsythia with gall-like growths up to nearly $\frac{1}{2}$ inch in diameter. These growths are not uncommon and consist of agglomerations of adventitious roots, produced in all probability by response to moist conditions about the stems. They may be found mostly near the base of the plant but sometimes higher up, especially when the plant is grown on a wall. Neither animal or vegetable parasite is connected with their production.

Parasite of Watercress—Mr. G. Fox Wilson showed specimens of Watercress attacked by the larvae of the two-winged fly, *Hydrellia nasturtii*, which bores into the stems and also pupates there. The symptoms of attack are the wilting and yellowing of stems and leaves. So far as is known the attack is confined to growths in January and February, and several reports of infestations have been received from Wiltshire this year. The damage to the early crop is serious and no means are known of combating it, though the French investigators, Balachowsky and Mesnil, have proposed the cutting over and destruction of the plants in the beds in February. The first record of this species was made in 1928 by Mr. Taylor of Leeds who found it in Watercress from South England in January and February. The history of the pest in the remainder of the year is unknown.

Scented Daffodil—Mr. Gilnour showed a small Ajax Narcissus grown at Wisley from a bulb collected in Spain which seemed to about half the members of the Committee to have a Freesia scent, though the other half were unable to perceive it. It would be of interest to know whether others have found this scent in Daffodils.

Crinkled foliage of Crocus—Mr. Moore showed foliage of *Crocus longiflorus* with the terminal part crinkled. No parasite had been discovered in connexion with it and it was thought that it probably arose from pressure just before or at the time of its emergence from the soil. All the leaves on the plant were similarly affected.

Fritillarias—Miss Beck of Great Amwell, Ware, sent *Fritillaria bucharica* and *F. Sewerzowii* in flower in pots, remarkably well grown.

Narcissus triandrus—Mr. Ogilvie-Grant sent a plant of *Narcissus triandrus* with the flowers just opening with perianth pieces much greener than usual. It will be interesting to see whether this phenomenon is repeated next year. It occurs at times in other species of Narcissus.

Oxalis from S. Africa—A pan of a small Oxalis with brick-red flowers, originally from S. Africa, was shown by Mr. Ingwersen and was referred to Kew for naming. Dr. Turrill later reported it to be *Oxalis obtusa*, a species described by Jacquin, which comes with yellow to brick-red or pink flowers, and grows wild in south-west Cape Province. Mr. Ingwersen reports that it has withstood zero frosts with him.

RHODODENDRON COMMITTEE—Mr. CHARLES WILLIAMS, M.P., in the Chair, and eight other members present.

Award Recommended:

Award of Merit

To *Rhododendron magnificum* (votes 7 for, 0 against) as a hardy flowering shrub from Lt.-Col. D. R. Carrick-Buchanan, Corsewell, Stranraer, Wigtownshire.

Other Exhibits

Rhododendron (Elsae × eximium), from The Rt. Hon. The Earl of Stair, D.S.O., K.T., Stranraer, Wigtownshire.

Rhododendron Macabeum (F.C.C. 1938), from Lt.-Col. D. R. Carrick-Buchanan, Corsewell, Stranraer, Wigtownshire.

Rhododendron ? sutchuenense to be sent to Edinburgh for verification of its name, from Capt. Collingwood Ingram, Benenden, Kent.

JOINT ROCK GARDEN PLANT COMMITTEE—Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and eleven other members present.

Exhibits

Primula 'Margaret' (P. Allionii × ? P. Berninae) and *Oxalis* sp. which was referred to the Scientific Committee for naming, from Messrs. W. E. Th. Ingwersen, Ltd., Birch Farm Hardy Plant Nursery, East Grinstead, Sussex.

APRIL 4, 1950

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and nine other members present.

Various fruits—Mr. Gould showed the large fruit of *Stephanotis floribunda* from Mrs. Dickinson, S. Rhodesia, with the numerous seeds with a tuft of silky hair which aids their distribution. He also showed nutmegs grown in Jamaica, sent by Prof. McLean Thompson.

Primula with virescent calyx—Mr. Robinson showed a 'Jack in the Green' Polyanthus with the sepals developed into large leafy structures nearly $1\frac{1}{2}$ inches long—an extreme development of this form. The younger flowers in the umbel had normal calyces, but the bracts were more or less virescent though much smaller than the sepals.

Brodiaea uniflora—Mr. Stearn showed two forms of this species, one with broader and rounder tepals than the other, the former was apparently the plant figured by J. G. Baker as *Triteleia conspicua*. The flowers of the broad form were apparently nearly white but were nearly over, the other freshly opened showed much violet coloration. This plant has been placed in many genera and recently Rafinesque's name, *Ipheion uniflorum*, has been revived for it.

Twin-flowered Snowdrop—Mrs. N. G. Thompson of The Red House, Escrick, York, who on March 7, 1950, showed a twin-flowered Snowdrop, now sent a fruit which showed a distinct suture as though double; this was apparent in fruits on both of the single and twin-flowered scapes which occurred in the clump. The accompanying leaves were narrow and channelled but too old to show characters which could be relied upon to distinguish the species.

Large-flowered Ranunculus—A very large flowered *Ranunculus* collected in Morocco by Mrs. Scott-Moncrieff, of Halesworth, was shown and reserved for future consideration.

Daffodil with dialysed perianth and corona—A seedling Daffodil was sent by Mr. F. S. Neale of Berwick House, Shrewsbury, with the nearly white perianth tube deeply divided into 6 regular segments, on the face of each of which a portion of the yellow corona, nearly as long as the segments, was borne. The stamens and pistil appeared normal. The peculiarity was reproduced each year by the offsets from the original seedling.

Phaedranassa viridiflora—Mrs. Spitta of Badger's Rake, Godalming, sent this Peruvian plant, introduced many years ago but now rarely seen.

Trilliums—Mr. W. Miles of Ingersoll, Ontario, wrote, drawing attention to the great variation in *Trillium grandiflorum* found in the wild plants. On the sandy soil on the north shore of Lake Erie the plants usually have almost strap-shaped petals but in Oxford County the petals are much broader. The width of the green stripe varies greatly and in some the petals are entirely green, while there is variation in the number of petals, up to 9. Some of the groups contain many variants but in others the plants appear to be similar though no difference is apparent in the soil. On the lower land, where the forest consists of *Acer saccharinum*, *T. grandiflorum* is replaced by *T. erectum* which also shows variation in colour from the foetid liver-coloured form through all shades of rosy-purple to yellow and occasionally white.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and twenty other members present.

Awards Recommended:

Silver-gilt Banksian Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.

Silver Banksian Medal

To Messrs. Kelway & Son, Ltd., Langport, for an exhibit of Daffodils and Hyacinths.

Flora Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of various Dianthus.

Banksian Medal

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Polyanthus and Blue Primroses.

To Messrs. Read's Hybridizing Nurseries, Hockley, for an exhibit of Pansies.

Other Exhibits

Aubrietias from Messrs. Thomas Carlile (Loddon Nurseries) Ltd., Twyford, Berks.
Daffodils, Tulips, shrubs, etc., from Messrs. Southern Growers, Ltd., Groombridge.
Gold-laced Polyanthus from Bartley Nurseries, Bartley.
Primroses, Polyanthus, Anemones, from Mr. C. Newberry, Knebworth.
Violas and Daffodils from Mr. C. A. Jardine, Feltham.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, twenty-six other members, and Mr. RALPH PEER (visitor) present.

Awards Recommended:

Gold Medal

To Messrs. Hillier & Son, Winchester, for an exhibit of Magnolias and Camellias.
To Sir Giles Loder, Bt., Leonardslee, for an exhibit of Camellias and Magnolias.
To Messrs. R. C. Notcutt, Ltd., Woodbridge, for an exhibit of Magnolias, Cherries and other trees and shrubs.
To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of Magnolias, Camellias and other flowering trees and shrubs.

Silver-gilt Flora Medal

To Lord Aberconway and the National Trust, Bodnant, for an exhibit of Magnolias.

Silver-gilt Banksian Medal

To the Donard Nursery Co., Ltd., Newcastle, Co. Down, for an exhibit of flowering trees and shrubs.
To the Director, Royal Botanic Gardens, Kew, for an exhibit of varieties of *Camellia japonica*.
To E. de Rothschild, Esq., Exbury, for an exhibit of Magnolias and Camellias.
To Messrs. D. Stewart & Son, Ltd., Ferndown, for an exhibit of flowering shrubs and bulbous plants.
To Messrs. R. Veitch & Son, Ltd., Exeter, for an exhibit of Magnolias, Camellias and other flowering trees and shrubs.
To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of Cherries, Camellias, and other flowering trees and shrubs.

Silver Flora Medal

To Messrs. G. & A. Clark, Ltd., Dover, for an exhibit of flowering shrubs and Primulas.
To the Commissioners of Crown Lands, Windsor Great Park, for an exhibit of Camellias and Magnolias and specimens illustrating methods of propagation.
To Mr. W. J. Marchant, Wimborne, for an exhibit of flowering shrubs.
To Sir Henry Price, Ardingly, for an exhibit of Magnolias and Camellias.
To Messrs. Sale & Son, Ltd., Wokingham, for an exhibit of flowering trees and shrubs.
To Messrs. Wm. Wood & Son, Ltd., Taplow, for an exhibit of Cherries and other flowering trees and shrubs.

Silver Banksian Medal

To Messrs. S. Bide & Sons, Ltd., Farnham, for an exhibit of conifers and flowering shrubs.
To Mr. D. Burkwood, Rotherfield, for an exhibit of *Viburnum* hybrids.
To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of flowering trees and shrubs.
To Messrs. J. Cheal & Son, Crawley, for an exhibit of flowering trees and shrubs.
To Messrs. Haskins Bros., Ltd., Bournemouth, for an exhibit of Camellias.
To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, for an exhibit of rock garden plants.

Flora Medal

To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.
To Messrs. Kibble & Clare, Ltd., Ascot, for an exhibit of rock garden plants.
To Mrs. D. Mosenthal, Sunninghill, for an exhibit of Camellias.
To Messrs. M. Pritchard & Sons, Ltd., Christchurch, for an exhibit of rock garden plants and shrubs.
To Mr. F. Street, Woking, for an exhibit of Rhododendrons.
To the Sunningdale Nurseries, Windlesham, for an exhibit of flowering shrubs.
To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of rock garden plants.
To the Winkfield Manor Nurseries, Ascot, for an exhibit of rock garden plants and Rhododendrons.

Banksian Medal

To Mr. Stephen Sims, Draycott, for an exhibit of rock garden plants and shrubs.

Award of Merit

To *Camellia reticulata* 'Trewithen Pink,' as a hardy flowering shrub (votes unanimous), from G. H. Johnstone, Esq., O.B.E., Trewithen, Cornwall.
To *Clivia keuenis* 'Bodnant Yellow' as a flowering plant for the cool greenhouse (votes 6 for, 1 against), from Lord Aberconway, C.B.E., LL.D., V.M.H., Bodnant.

To *Prunus Persica* 'Aurora' as a hardy flowering tree (votes 15 for, 0 against), from Messrs. George Jackman & Son (Woking Nurseries) Ltd., Woking.

To *Prunus Persica* 'Iceberg' as a hardy flowering tree (votes unanimous), from Messrs. George Jackman & Son (Woking Nurseries) Ltd., Woking.

To *Prunus spinosa plena* as a hardy flowering tree (votes 14 for, 0 against), from Capt. Collingwood Ingram, Benenden.

Other Exhibits

Adiantum venustum, exhibited by C. H. Curtis, Esq., 5 Somerset Road, Brentford.

Amelanchier grandiflora rubescens, *Prunus Lannesiana*, exhibited by Mr. W. J. Marchant, Keeper's Hill, Staplehill, Wimborne.

Berberis lologensis Nymans form, exhibited by Lt.-Col. L. C. R. Messel, O.B.E., Nymans, Handcross.

Berberis sp. Yû 14938, exhibited by The Lord Digby, D.S.O., M.C., Cerne Abbey, Dorchester.

Camellia japonica anemoniflora, exhibited by the Director, R.H.S. Gardens, Wisley.

Camellia japonica var., *Prunus Padus Spaethii*, *P. subhirtella* 'Fukubana,' exhibited by Capt. Collingwood Ingram, Benenden.

Chaenomeles japonica 'Choshan,' exhibited by Mr. J. O. Sherrard, Shaw Nursery, Newbury.

Chaenomeles japonica 'Rowallane Seedling,' exhibited by H. Armytage-Moore, Esq., Rowallane, Saintfield, Co. Down.

Eriobotrya japonica, exhibited by the Superintendent, Bexley Heath Parks Dept., Kent.

Magnolia Dawsoniana, exhibited by Sir Henry Price, Wakehurst Place, Ardingly.

Michelia Doltsova, exhibited by Lord Aberconway, C.B.E., LL.D., V.M.H., Bodnant, N. Wales.

Michelia floribunda, exhibited by G. H. Johnstone, Esq., O.B.E., Trewithen, Cornwall.

Phaedranassa viridiflora, exhibited by Mrs. Spitta, Badger's Rake, Godalming.

Ranunculus sp., exhibited by Mrs. Scott-Moncrieff, Halesworth, Suffolk.

Camellias, exhibited by Messrs. J. Waterer, Sons & Crisp, Ltd., and the Director, R.H.S. Gardens, Wisley.

Clipped box-trees, exhibited by Kew Topiary Nursery Ltd., Richmond.

NARCISSUS AND TULIP COMMITTEE—Mr. E. A. BOWLES, F.L.S., V.M.H., in the Chair, and eleven other members present.

Awards Recommended:

Gold Medal

To Messrs. Barr & Sons, 11 King Street, Covent Garden, W.C. 2, for an exhibit of Daffodils.

To Mr. J. L. Richardson, Waterford, Eire, for an exhibit of Daffodils.

Silver-gilt Flora Medal

To Messrs. Walter Blom & Son, Ltd., Watford, for an exhibit of Tulips.

Silver-gilt Banksian Medal

To Major J. O. Sherrard, Shaw, Newbury, for an exhibit of Daffodils.

Silver Flora Medal

To Messrs. R. H. Bath, Ltd., Wisbech, for an exhibit of Daffodils.

To Messrs. H. M. & D. W. Gourlay, The Down House, Tockington, nr. Bristol, for an exhibit of Daffodils.

To Messrs. The Trenoweth Valley Flower Farm, Ltd., St. Keverne, Cornwall, for an exhibit of Daffodils.

To Messrs. R. Wallace & Co., Tunbridge Wells, for an exhibit of Daffodils and Tulips.

Silver Banksian Medal

To Messrs. W. A. Constable, Ltd., Tunbridge Wells, for an exhibit of Daffodils and Tulips.

Banksian Medal

To Mr. J. Jefferson-Brown, Cashel-Bruin, Merilies Close, Westcliff-on-Sea, Essex, for an exhibit of Daffodils and Tulips.

To Messrs. M. P. Kooper & Son, Ferndown, Dorset, for an exhibit of Daffodils.

First Class Certificate

To *Narcissus* 'Jenny' as a variety for exhibition (votes 6 for, 0 against). This large-flowered *cyclamineus* hybrid received an **A.M.** on April 6, 1948. See JOURNAL, 73, 355. Raised and shown by C. F. Coleman, Esq., Broomhill, Cranbrook, Kent.

Award of Merit

To *Narcissus* 'Broadwater' as a variety for exhibition (votes 8 for, 0 against). Raised and shown by Col. F. C. Stern, F.L.S., V.M.H., Highdown, Goring-by-Sea.

To *Narcissus* 'Mulrany' as a variety for exhibition (votes 7 for, 0 against). Raised and shown by Mr. J. L. Richardson.

To *Narcissus* 'Petsamo' as a variety for exhibition (votes 7 for, 0 against). Raised and shown by Mr. J. L. Richardson.

Daffodils Selected for Trial

The following Daffodils were selected for trial at Wisley as varieties for garden decoration:—

Narcissus 'Jenny' and *N.* 'Charity May' shown by C. F. Coleman, Esq.

Narcissus 'Royal Mail,' shown by Mr. J. L. Richardson.

Narcissus 'Broadwater,' shown by Col. F. C. Stern.

Daffodils to be seen again

The Committee expressed a desire to see the following Daffodils at a future meeting:—

Narcissus 'Heaven,' shown by Messrs. H. M. & D. W. Gourlay, Tockington, nr. Bristol.

Narcissus 'Irish Luck,' shown by Messrs. Zandbergen-Terwegen, Sassenheim, Holland.

Other Exhibits

Narcissus 'Bahram,' *N.* 'Beirut,' *N.* 'Matapan' and *N.* 'White Empire,' shown by Mr. J. L. Richardson.

Narcissus triandrus aurantiacus, shown by H. Farmar, Esq., The Royal Cottage, Kew, Surrey.

A sport from *Narcissus* 'John Evelyn,' shown by D. A. Lloyd, Esq., 34 Springfield Road, St. John's Wood, London, N.W. 8, was referred to the Scientific Committee.

A Trumpet Daffodil with the corona split into five segments, shown by F. S. Neale, Esq., Berwick House, Shrewsbury, was referred to the Scientific Committee.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and thirteen other members present.

Awards Recommended:**Silver Flora Medal**

To Messrs. Stuart Low & Co., Jarvis Brook, for a group of Orchids.

Silver Banksian Medal

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

Award of Merit

Laeliocattleya 'Eva Robinson' var. 'Easter' (*Lc.* 'Ishtar' × *C.* 'Angus') (votes 9 for, 1 against), from Messrs. Black & Flory, Slough.

Odontoglossum 'Elise' var. 'Gloria' ('*Ascania*' × *triumphans*) (votes 9 for, 1 against), from Messrs. Charlesworth & Co., Haywards Heath.

Odontioda 'Lita' var. 'Neon' (*Oda.* 'Marie Antoinette' × *Oda. Pittiae*) (votes 11 for, 0 against), from Messrs. Charlesworth & Co., Haywards Heath.

Brassocattleya 'Juno' (*C.* 'Titrianae' × *Bc.* 'Olympic') (votes 11 for, 0 against), from H. W. B. Schroder, Esq., Dell Park, Englefield Green, Surrey.

Preliminary Certificate

Cymbidium 'Dorama' ('*Dorchester*' × '*President Wilson*') (votes 11 for, 0 against), from McBean's Orchids Ltd., Cooksbridge, Sussex.

JOINT IRIS COMMITTEE—Col. F. C. STERN, O.B.E., in the Chair and ten other members present.

Exhibit

Iris Wattii (A.M. in 1938 as a tender plant) shown by C. W. Christie-Miller, Esq., Swyncombe House, Henley-on-Thames.

JOINT ROCK GARDEN PLANT COMMITTEE—Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and nine other members present.

Award Recommended:**Award of Merit**

To *Androsace pyrenaica* as a hardy flowering plant for the Alpine House from C. H. Hammer, Esq., The Old Rectory, Boreham, Essex.

Other Exhibits

Anemone Pulsatilla var. 'Red Repose' from Messrs. Maurice Prichard & Sons, Ltd., Riverslea Nurseries, Christchurch, Hants.

Primula denticulata 'Ascot Hybrids' Nos. 8, 59 and 65, from Messrs. Kibble & Clare, Ltd., Ascot Wood Nursery, Ascot, Berks.

APRIL 13, 1950

NARCISSUS AND TULIP COMMITTEE—Mr. E. A. BOWLES, F.L.S., F.R.E.S., V.M.H., in the Chair, and twenty-six other members present.

The Peter Barr Memorial Cup

It was unanimously recommended that the Peter Barr Memorial Cup, which is awarded annually to someone who has done good work on behalf of the Daffodil, should be awarded for 1950 to Mr. Herbert R. Barr.

Awards Recommended:

Gold Medal

To Mr. W. J. Dunlop, Dunrobin, Ballymena, Northern Ireland, for an exhibit of Daffodils.

To Mr. J. L. Richardson, Prospect House, Waterford, Eire, for an exhibit of Daffodils.

Silver-gilt Flora Medal

To Messrs. Barr & Sons, 11-13 King Street, Covent Garden, London, W.C. 2, for an exhibit of Daffodils.

To Mr. Guy L. Wilson, The Knockan, Broughshane, Co. Antrim, Northern Ireland, for an exhibit of Daffodils.

Silver-gilt Banksian Medal

To Messrs. Walter Blom & Son, Ltd., Watford, Herts, for an exhibit of Daffodils.

To Messrs. W. A. Constable, Ltd., Tunbridge Wells, Kent, for an exhibit of Daffodils.

To Major J. O. Sherrard, Shaw, Newbury, Berks, for an exhibit of Daffodils.

Silver Flora Medal

To Messrs. R. H. Bath, Ltd., Wisbech, Cambs., for an exhibit of Daffodils.

To Mr. Alec Gray, Treswithian Daffodil Farm, Camborne, Cornwall, for an exhibit of Daffodils.

To Messrs. The Trenoweth Valley Flower Farm, Ltd., St. Keverne, Cornwall, for an exhibit of Daffodils.

Silver Banksian Medal

To Messrs. H. M. & D. W. Gourlay, The Down House, Tockington, nr. Bristol, for an exhibit of Daffodils.

To Messrs. M. P. Kooper & Son, Ferndown, Dorset, for an exhibit of Daffodils.

To Messrs. Zandbergen-Terwegen, Sassenheim, Holland, for an exhibit of Daffodils.

Flora Medal

To Messrs. G. Lubbe & Son, Oegstgeest, Holland, for an exhibit of Daffodils.

To Messrs. Partridge & Lower, Starcross, Devon, for an exhibit of Daffodils.

To Mr. Raymond Perks, Berrow, Burnham-on-Sea, Somerset, for an exhibit of Daffodils.

Banksian Medal

To Mr. J. Jefferson-Brown, 16 Merrilies Close, Westcliff-on-Sea, Essex, for an exhibit of Daffodils.

Award of Merit

To *Narcissus* 'Tudor Minstrel,' as a variety for exhibition (votes 16 for, 8 against). Raised and shown by Mr. J. L. Richardson.

To *Narcissus* 'Firemaster,' as a variety for exhibition (votes 18 for, 3 against). Raised and shown by Mr. J. L. Richardson.

To *Narcissus* 'Glensheak,' as a variety for exhibition (votes 22 for, 1 against). Raised and shown by Mr. Guy L. Wilson.

Certificate of Preliminary Commendation

To *Narcissus* 'King's Ranson,' shown by Mr. J. L. Richardson.

Daffodils Selected for trial

Narcissus 'Roselene,' shown by Mrs. E. A. Hanger, The Royal Horticultural Society's Gardens, Wisley, was selected for trial as a variety for garden decoration.

Other Exhibits

Daffodils, shown by Mr. C. A. Jardine, 45 Percival Road, Feltham, Middlesex.

Narcissus 'Edith Amy' and *N.* 'Laddie,' shown by Mrs. E. A. Hanger, The Royal Horticultural Society's Gardens, Wisley.

Narcissus 'Severn,' shown by Dr. D. R. Acheson, Berkeley, Glos.

Narcissus 'Spellbinder,' *N.* 'Rosario,' *N.* 'Moonstruck,' and *N.* 'Tornamona,' shown by Mr. Guy L. Wilson.

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE—Mr. G. MONRO, C.B.E., V.M.H., in the Chair, and fourteen other members present.

Exhibits

'Brumas,' shown by Mr. J. R. Bell, Southdown Nurseries, Cross in Hand, Sussex. A sport from Market Pink.

APRIL 18, 1950

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, seven other members and Mr. OGILVIE-GRANT (visitor) present.

Large-flowered Ranunculus.—Dr. W. B. Turrill reported that the *Ranunculus* collected in Morocco by Mrs. Scott-Moncrieff, of Halesworth, was *R. spicatus*, well figured in *Bot. Mag.* t. 4585.

Specific Gravity of Gladiolus corms.—Mr. R. L. Roberts, of Lansdale Drive, Enfield, sent a note on some observations he had made on the specific gravity of corms of the large-flowered Gladioli. He found that (1) a dormant corm has a sp.gr. of approximately $1\cdot2/1\cdot3$; (2) during March and April the sp. gr. decreases to approximately $1\cdot05/1\cdot1$. He suggests that this would account partially for the lack of timing of the Gladiolus, as an intake of water of about 12 per cent. is necessary before growth of the corm begins, and it eventually increases to 18 to 20 per cent. "If investigation shows this hypothesis to be correct then it should be possible (1) to lay down a standard of curing (it may be shown that corms with too high a water content in the dormant state tend to rot) of corms. (2) To see if dormant disease in a corm not apparent from outside may be discovered by means of taking the sp. gr. (3) To assist in investigations into the timing of the flower. It may also be shown that the water content of a corm is not constant throughout the corm and it is possible that the flower direction faces the corm area that has the highest water content."

Paulownia Fortunei.—M. Dental sent an inflorescence and photographs of the flowers of this rare tree, a native of S. China, from the south of France. The flowers were unfortunately withered, but the photographs showed a large terminal panicle of handsome spotted flowers.

Grecian Plants, including several Orchids and an Allium from Greece, were shown by Mr. Ogilvie-Grant and were referred to Mr. Summerhayes for the identification of the Orchids and the Allium to Mr. Stearn.

Spotting of Rhododendron leaves.—Dr. Turrill showed leaves of a Rhododendron from his garden at Kew showing purple-brown spots between the veins not associated with either insect or fungus attack but suspected of having been caused by fumes from a nearby gasworks.

FRUIT AND VEGETABLE COMMITTEE—Mr. A. Cheal, in the Chair, and nine other members present.

Exhibits

A group of Strawberries 'Royal Sovereign, Pinetree Strain,' from Mr. H. S. Melbourn, Pinetree Farm, Cranborne, Wimborne, Dorset.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended:

Silver-gilt Banksian Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.

To Messrs. Konynenburg & Mark, Noordwyk, Holland, for an exhibit of Freesias.

Silver Flora Medal

To Messrs. Napier, Ltd., Taunton, for an exhibit of Carnations.

Silver Banksian Medal

To Messrs. R. & E. Ratcliffe, Chilton, for an exhibit of Roses.

To Messrs. R. Wallace & Co., Tunbridge Wells, for an exhibit of Daffodils, Tulips, Azaleas, etc.

Flora Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Dianthus.

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Polyanthus.

To Messrs. Wakeley Bros. & Co., Ltd., North Mymms, for an exhibit of Daffodils, Tulips and other hardy plants.

To Messrs. E. Webb & Sons (Stourbridge), Ltd., Stourbridge, for an exhibit of *Cinerarias*.

To Messrs. E. Webb & Sons (Stourbridge), Ltd., Stourbridge, for an exhibit of *Schizanthus* and *Primula malacoides*.

Banksian Medal

To Mr. J. W. Read, Hockley, for an exhibit of Pansies.

Other Exhibits

Anemones, Gentians, Polyanthus, from Mr. C. Newberry, Knebworth.

Polyanthus 'Admiration,' from C. H. Walkden, Esq., Mitcham.

Primula pubescens 'Karen Newberry,' Aubrietias, Violas, from Old Welwyn Gardens, Welwyn.

Violas and Daffodils, from Mr. C. A. Jardine, Feltham.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and eighteen other members present.

Awards Recommended:

Silver-gilt Flora Medal

To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of Japanese Cherries.

Silver-gilt Banksian Medal

To Messrs. Hillier & Sons, Winchester, for an exhibit of Japanese Cherries and other flowering trees and shrubs.

Silver Flora Medal

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of Rhododendrons and other flowering trees and shrubs.

To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, for an exhibit of rock garden plants.

Silver Banksian Medal

To Mr. F. Street, Woking, for an exhibit of Rhododendrons.

Lindley Medal

To Dr. C. N. Goulimy, Athens, for an exhibit of wild flowers collected on Mt. Parnes, Greece.

Flora Medal

To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of flowering trees and shrubs.

To Messrs. G. & A. Clark, Ltd., Dover, for an exhibit of flowering shrubs and rock garden plants.

To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.

To Old Court Nurseries, Colwall, Malvern, for an exhibit of rock garden plants and shrubs.

To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of rock garden plants and shrubs.

To Messrs. Robinson, Eltham, for an exhibit of rock garden plants.

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of flowering trees and shrubs.

To Messrs. Sale & Son, Ltd., Wokingham, for an exhibit of flowering trees and shrubs.

To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of rock garden plants.

To Winkfield Manor Nurseries, Ascot, for an exhibit of rock garden plants and shrubs.

To Messrs. Wm. Wood & Son, Ltd., Taplow, for an exhibit of aromatic foliage plants.

Banksian Medal

To Messrs. Carlile, Twyford, for an exhibit of rock garden plants.

To MacPenny Nurseries, Bransgore, for an exhibit of rock garden plants.

To Mr. Stephen Sims, Draycott, for an exhibit of rock garden plants.

Cultural Commendation

To Mr. G. P. Baker, Hillside, Oakhill Road, Sevenoaks, for an exhibit of *Paeonia Clusii*.

Other Exhibits

Helleborus viridis, exhibited by J. W. Baker, Esq., 'Daydawn,' Wickham Bishops, Witham, Essex.

Paulownia Fortunei, exhibited by Messrs. J. B. Dental & Cie, Pepinieres du Litonal, Route de Cannes, Golfe-Jaun.

Prunus Jacquemontii, *P. serrulata* 'Imosé,' exhibited by Capt. Collingwood Ingram, Benenden, Kent.

Extracts from THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY

GENERAL MEETINGS

APRIL 4, 1950

RHODODENDRON COMMITTEE—Mr. CHARLES WILLIAMS, M.P., in the Chair, and eleven other members present.

Arising out of the previous Minutes.—Dr. J. Macqueen Cowan has verified that the plant brought before the Committee on March 21 as *Rhododendron magnificum* was correctly named and identified Capt. Collingwood Ingram's plant, submitted as *Rhododendron ? sutchuenense*, as *Rhododendron praevernum*.

Awards Recommended:

First-class Certificate

To *Rhododendron* 'Trewithen Orange' ('Full House' \times *concatenans*) (votes 12 for, 0 against), as a hardy flowering shrub, from G. H. Johnstone, Esq., O.B.E., Trewithen, Cornwall.

Award of Merit

To *Rhododendron* 'Fascinator' ('Hiraethlyn' \times *repens*) (votes 6 for, 0 against), as a hardy flowering shrub, from Lord Aberconway, C.B.E., LL.D., V.M.H., and The National Trust, Bodnant, North Wales.

To *Rhododendron* 'Mariloo' var. 'Eugenie' ('Dr. Stocker' \times *lacteum*) (votes 7 for, 0 against), as a hardy flowering plant, from E. de Rothschild, Esq., Exbury, nr. Southampton.

To *Rhododendron* 'Janet' ('Dr. Stocker' \times 'Avalanche') (votes 11 for, 0 against), as a hardy flowering plant, from E. de Rothschild, Esq., Exbury, nr. Southampton.

Other Exhibits

R. 'Rhythm' (*aperantum* pink form \times *repens*), R. 'Beauty of Tremough' Bodnant form (*arboreum* \times *Griffithianum*), R. 'Chiron' ('Barclayi' \times *haematodes*), R. 'Grandex' (*eximium* \times *sinogrunde*), R. 'May Morn' red form ('May Day' \times *Beanianum*) (A.M. 1946), R. *basilicum* (Farrer 873) and R. 'Nymph' (*repens* \times 'Largo'), from Lord Aberconway, C.B.E., LL.D., V.M.H., and the National Trust, Bodnant, North Wales.

R. 'Avalanche' var. 'Alpine Glow' ('Loderi' \times *calophytum*) (A.M. 1938), from E. de Rothschild, Esq., Exbury, nr. Southampton.

R. 'Countess of Sefton' (*Edgeworthii* \times *multiflorum*), from G. Lane-Roberts, Esq., Mill House, Tewin, Herts.

R. 'Evening' (*Hodgsonii* \times 'Mansellii' var. 'Muriel'), from Sir Giles Loder, Bt., Leonardslee, Horsham, Sussex.

APRIL 18, 1950

NARCISSUS AND TULIP COMMITTEE—Mr. E. A. BOWLES, F.L.S., F.R.E.S., V.M.H., in the Chair, and ten other members present.

Awards to Daffodils after Trial at Wisley

The following awards to Daffodils as varieties for garden decoration were made as the result of the report of the Sub-Committees which met at Wisley on March 31 and April 14.

First-class Certificate

To *Narcissus* 'Market Merry,' sent by Cmdr. A. M. Williams, Werrington Park, Launceston, Cornwall.

Award of Merit

To *Narcissus* 'Nissa' and N. 'Polindra,' sent by Messrs. Barr & Sons, 11-13 King Street, Covent Garden, London, W.C. 2.

To *Narcissus* 'Actaea,' sent by Messrs. R. H. Bath, Ltd., Wisbech.

Highly Commended

To *Narcissus* 'His Excellency,' sent by Mr. W. J. Dunlop, Dunrobin, Ballymena, Northern Ireland.

To *Narcissus* 'Farewell,' sent by M. P. Williams, Esq., M.B.E., Lanarth, St. Keverne, Cornwall.

Awards Recommended:

Silver-gilt Flora Medal

To Messrs. Walter Blom & Son, Ltd., Watford, Herts., for an exhibit of Daffodils.

Silver Flora Medal

To Messrs. Barr & Sons, 11-13 King Street, Covent Garden, London, W.C. 2, for an exhibit of Tulips and Daffodils.

To Major J. O. Sherrard, Shaw, Newbury, Berks., for an exhibit of Daffodils.

Silver Banksian Medal

To Messrs. The Trenoweth Valley Flower Farm, Ltd., St. Keverne, Cornwall, for an exhibit of Daffodils and Tulips.

Flora Medal

To Messrs. M. P. Kooper & Son, Ferndown, Dorset, for an exhibit of Daffodils and Tulips.

Banksian Medal

To Mr. J. Jefferson-Brown, Merrilies Close, Westcliff-on-Sea, Essex, for an exhibit of Daffodils and Tulips.

To Messrs. G. Zandbergen-Terwegen, Sassenheim, Holland, for an exhibit of Daffodils.

Award of Merit

To *Narcissus* 'Golden Ducat,' as a variety for exhibition (votes 6 for, 1 against). Shown by Messrs. G. Zandbergen-Terwegen.

Other Exhibits

Narcissus 'Adur,' shown by Col. F. C. Stern, F.L.S., V.M.H., Highdown, Goring-by-Sea, Sussex.

RHODODENDRON COMMITTEE—Lt.-Col. Lord STRATHCONA AND MOUNT ROYAL, in the Chair, and twelve other members present.

Exhibits

R. 'Gillian Spencer' and R. 'Gillian Spencer' var. 'Bodil' (*haematodes* × 'Ascot Brilliant' × *neriiflorum*) and R. 'Caroline Spencer' (*Fortunei* × *Williamsianum*) from Murray Adams-Acton, Esq., 37 Palace Gate, Kensington, W. 8.

JOINT IRIS COMMITTEE—Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and eight other members present.

Awards Recommended:

Award of Merit

To *Iris cristata*, as a hardy flowering plant (votes 8 for, 0 against), shown by Mr. J. O. Sherrard, Shaw Nursery, Newbury, Berks.

Cultural Commendation

To *Iris Grant-Duffii*, shown by Col. F. C. Stern, O.B.E., Highdown, Goring-by-Sea, Sussex.

JOINT ROCK GARDEN PLANT COMMITTEE—Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and nine other members present.

Award Recommended:

Award of Merit

To *Muscari Tubergenianum*, as a hardy flowering plant for the Rock Garden, from R. W. Wallace, Esq., V.M.H., The Old Gardens, Tunbridge Wells, Kent.

Other Exhibits

Paeonia Cambessedesii (A.M. 1935) from R. E. Heath, Esq., 13 Maybury Close, Petts Wood, Orpington, Kent.

Ranunculus gramineus grandiflorus, which the Committee would like to see again, from Messrs. Maurice Prichard & Sons, Ltd., Riverslea Nurseries, Christchurch, Hants.

APRIL 25, 1950

JOINT ROCK GARDEN PLANT COMMITTEE—Mrs. VERA HIGGINS, M.A., F.L.S., V.M.H., in the Chair, and nine other members present.

Awards Recommended:

Award of Merit

To *Campanula pilosa* var. *dasyantha*, as a hardy flowering plant for the Rock Garden and Alpine House, from R. E. Heath, Esq., 13 Maybury Close, Petts Wood, Kent.

Preliminary Commendation

To *Asyneuma Lycium*, from Miss E. M. Savory, Emberton House, Olney, Bucks.

Cultural Commendation

To Mrs. A. N. Griffith, Paradise House, Newnham, Cambridge, for a particularly well-grown plant of *Eritrichium nanum* (A.M. 1938.)

Other Exhibits

Vaccinium Delavayi, which the Committee desires to see at a future meeting, from R. E. Heath, Esq., 13 Maybury Close, Petts Wood, Kent.

Senecio uniflorus, from Mrs. A. N. Griffith, Paradise House, Newnham, Cambridge.

Epimedium Youngianum niveum, from Miss H. Davenport Jones, Washfield Nurseries, Hawkhurst, Kent.

Pleione Pricei (A.M. 1920), to be sent to Kew for verification of its name, from Mrs. G. Anley, St. George's, Wych Hill Lane, Woking.

Leucorum longifolium, *Aquilegia flabellata*, *Primula Ellisiae*, and *Mertensia viridis* var. *coriacea*, which the Committee desires to see at a future meeting, from F. M. Peacock, Esq., Lowlands Cottage, Tritton Avenue, Beddington.

Phlox stolonifera var. 'Blue Ridge' (P.C. 1949), which was referred to Floral Committee 'B,' from Messrs. W. E. Th. Ingwersen, Ltd., Birch Farm Hardy Plant Nursery, East Grinstead, Sussex.

Mertensia viridis var. *coriacea*, which the Committee desires to see at a future meeting, from Lt.-Col. Brammell, Alpine Nursery, Nomansland, nr. Salisbury.

Hyacinthus sp., from H. Clifford Crook, Esq., 4 Alexandra Crescent, Bromley, Kent. *Primula umbratilis* (Ludlow and Sherriff 1912) (P.C. 1939 and A.M. 1941), from R. B. Cooke, Esq., Kilbryde, Corbridge, nr. Newcastle-upon-Tyne.

MAY 2, 1950

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and seven other members present.

Snow damage at Wisley.—Mr. J. S. L. Gilmour showed photographs illustrating the damage done by the fall of snow amounting to 5 in. a week previous. Many trees had been broken including two large Amelanchiers which were practically smashed, Cherries, Birches, Pines and some Oaks as well as a large *Magnolia Soulangeana*. The snow was wet and accordingly unusually heavy and probably the trees being full of sap were more brittle than usual.

Stolons in Allium unifolium.—Mr. W. T. Stearn showed growing plants of *Allium unifolium* which were producing from the bulb short apically thickened stolons. The exact nature of the swollen portion had not been determined but the stolon appeared to have a growing point at the distal end.

Various plants.—A living plant of *Gladiolus ceresianus* in flower was shown by Prof. T. T. Barnard, of Wareham. It has recently been figured in the *Botanical Magazine*, new series, t. 104. Mr. A. V. Pike, gardener at Hever Castle, sent *Isia paniculata*, long known in cultivation but very rarely seen, remarkable for the very long slender tubes of the perianth. It was shown to the Committee under the name *I. longiflora*; Mr. Pike also sent for identification *Ornithogalum thyrsoides*, white flowered form; and Mr. C. E. Sexton, Redhill, the beautiful *Menziesia ciliicalyx* var. *eglandulosa*.

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRETT, C.B.E., F.L.S., V.M.H., in the Chair, and thirteen other members present.

Exhibits

A group of Strawberries 'Royal Sovereign, Pinetree Strain,' from H. S. Melbourn, Esq., Pinetree Fruit Farm, Cranborne, Wimborne, Dorset.

Two Apple seedlings, from R. Prior, Esq., Setts Wood Farm, Tenterden, Kent.

Apple 'Herbert's Seedling,' from Mrs. L. D. B. Satterthwaite, 16 Ravenscroft Park, High Barnet, Herts.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and twenty-three other members present.

Awards Recommended:*Gold Medal*

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Polyanthus.

Silver-gilt Banksian Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.

Silver Flora Medal

To Messrs. Martlock Bros., Langley, for an exhibit of Fuchsias.

To Messrs. Napier, Ltd., Taunton, for an exhibit of Carnations.

Silver Banksian Medal

To Messrs. Kelway & Son, Ltd., Langport, for an exhibit of Irises.

Flora Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Dianthus.

To Lynwood Nurseries (Teddington), Ltd., Teddington, for an exhibit of Gloxinias.

To Ovenden Wood Nursery, Halifax, for an exhibit of Violas.

To Messrs. W. Wood & Son, Ltd., Taplow, for an exhibit of Pelargoniums and fragrant herbs.

Banksian Medal

To Messrs. M. P. Kooper & Son, Ferndown, for an exhibit of Tulips, Daffodils and shrubs.

To Mr. J. W. Read, Hockley, for an exhibit of Pansies.

To Messrs. Sale & Son (Wokingham), Ltd., Wokingham, for an exhibit of Rose 'Donald Prior.'

Other Exhibits

Anemones, Gentians, etc., from Mr. C. Newberry, Knebworth.

Auricula seedlings, from C. J. Howlett, Esq., Earley.

Hippeastrum 'Scarlet King,' from Messrs. Stuart Low & Co., Bush Hill Park.

Roses, from Messrs. Wheatcroft Bros., Ltd., Ruddington.

Violas, from Mr. C. A. Jardine, Feltham.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair and twenty-three other members present.

Awards Recommended:

Gold Medal

To Sir Giles Loder, Bt., Leonardslee, for an exhibit of varieties and hybrids of *Rhododendron Loderi*.

Silver-gilt Flora Medal

To Messrs. Hillier & Sons, Winchester, for an exhibit of Rhododendrons and Azaleas.

Silver-gilt Banksian Medal

To Sunningdale Nurseries, Windlesham, for an exhibit of Azaleas

To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of Cherries and other trees and shrubs

Silver Flora Medal

To Messrs. D. Stewart & Son, Ltd., Ferndown, for an exhibit of Azaleas.

To Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of Azaleas.

Silver Banksian Medal

To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of flowering shrubs.

To Messrs. G. & A. Clark, Ltd., Dover, for an exhibit of flowering shrubs and hardy plants.

To Mr. Leonard S. Harbutt, Newmarket, for an exhibit of flowering trees and shrubs.

To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, for an exhibit of rock garden plants.

To Knap Hill Nursery, Ltd., Woking, for an exhibit of Rhododendrons and Azaleas.

To Old Welwyn Gardens, Welwyn, for an exhibit of rock garden plants.

To Messrs. Robinson, Eltham, for an exhibit of rock garden plants.

To Mr. F. Street, Woking, for an exhibit of Rhododendrons.

To Winkfield Manor Nurseries, Ascot, for an exhibit of rock garden plants.

Lindley Medal

To Mrs. Garnett-Botfield, Beamish, Albrighton, Wolverhampton, for an exhibit of varieties of *Rhodohypoxis Baurii*.

Flora Medal

To Messrs. Carlile, Twyford, for an exhibit of rock garden plants.

To Messrs. Hale & May, Ltd., Cookham, for an exhibit of rock garden plants.

To Messrs. Kibble & Clark, Ltd., Ascot, for an exhibit of rock garden plants.

To MacPenny Nurseries, Bransgore, for an exhibit of shrubs and rock garden plants.

To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of shrubs and rock garden plants.

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of greenhouse plants.

To Mr. C. H. Sands, Harpenden, for an exhibit of *Gentiana acaulis*.

To Messrs. Sale & Sons, Ltd., Wokingham, for an exhibit of Azaleas and other flowering shrubs.

Banksian Medal

To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.

To Hollybush Nurseries, Harpenden, for an exhibit of rock garden plants.

To Messrs. W. H. Rogers & Sons, Eastleigh, for an exhibit of Azaleas, etc.

To Mr. Stephen Sims, Draycott, for an exhibit of rock garden plants.

To Verulam House Nursery, St. Albans, for an exhibit of rock garden plants.

To Messrs. E. J. Woodman & Sons, Pinner, for an exhibit of Azaleas and rock garden plants.

Award of Merit

To *Camellia japonica* 'Pink Pearl,' as a hardy flowering shrub (votes 14 for, 0 against), from Capt. Collingwood Ingram, Benenden.

To *Ixia paniculata*, as a greenhouse flowering plant, (votes 18 for, 0 against), from Mr. A. V. Pike, Edenbridge.

To *Prunus glandulosa albiplena*, as a hardy flowering shrub (votes 15 for, 0 against), from W. Bentley, Esq., Quarry Wood, Newbury.

To *Prunus serrulata* 'Okiku,' as a hardy flowering tree (votes 13 for, 0 against), from Capt. C. Ingram, Benenden.

Other Exhibits

Halesia carolina, exhibited by Major A. E. Hardy, Sandling Park, Hythe, Kent.

Iberis gibraltarica, exhibited by Capt. C. Ingram, Benenden, Kent.

Lilium (formosum × longiflorum), exhibited by G. W. Darby, Esq., Welwyn, Herts.

Michelia Doltsopa, exhibited by Lord Aberconway, C.B.E., LL.D., V.M.H., Bodnant, N. Wales.

Pimelea ferruginea, exhibited by Messrs. Hillier & Sons, Winchester

Prunus 'Pink Perfection,' exhibited by Messrs. John Waterer, Sons & Crisp, Ltd., Bagshot, Surrey.

Rosa omiensis lutea, exhibited by R. B. Purvis, Esq., Chadbury Mill House, Evesham.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and eleven other members present.

Awards Recommended:***Award of Merit***

To *Cymbidium* 'Clare Armstrong' var. 'Sunrise' (*Alexanderi* × 'Mirella') (votes 9 for, 0 against), from Messrs Armstrong & Brown, Tunbridge Wells.

To *Vuytstekeara* 'Angela' var. 'Jasper' (*Oda. Pittiae* × *Odnia*. 'Milly') (votes 11 for, 0 against), from Messrs. Charlesworth & Co., Haywards Heath.

NARCISSUS AND TULIP COMMITTEE—Mr. E. A. BOWLES, F.L.S., F.R.E.S., V.M.H., in the Chair, and ten other members present.

Awards Recommended:***Silver-gilt Flora Medal***

To Messrs. Barr & Sons, 11-13 King Street, Covent Garden, London, W.C.2, for an exhibit of Tulips.

To Messrs. Dobbie & Co., Ltd., Edinburgh, for an exhibit of Tulips.

To Mr. Guy L. Wilson, Broughshane, Co. Antrim, Northern Ireland, for an exhibit of Daffodils.

Silver-gilt Banksian Medal

To Mr. W. J. Dunlop, Ballymena, Northern Ireland, for an exhibit of Daffodils.

Silver Flora Medal

To Messrs. Kelway & Son, Ltd., Langport, Somerset, for an exhibit of Tulips and Daffodils.

Silver Banksian Medal

To Messrs. The Trenoweth Valley Flower Farm, Ltd., St. Keverne, Cornwall, for an exhibit of Tulips.

Award of Merit

To *Narcissus* 'Cargan,' as a variety for exhibition (votes 6 for, 0 against). Raised by Mr. Guy L. Wilson and shown by Mr. W. J. Dunlop.

To *Narcissus* 'Contour,' as a variety for exhibition (votes 7 for, 0 against). Raised and shown by Mr. Guy L. Wilson.

To *Narcissus* 'Virtue,' as a variety for exhibition (votes 6 for, 0 against). Raised and shown by Mr. Guy L. Wilson.

Daffodils Selected for Trial

Narcissus 'Bastion,' shown by Mr. Guy L. Wilson, was selected for trial as a variety for garden decoration.

Other Exhibits

Narcissus 'Gallilee,' *N.* 'Interim' and *N.* 'Shipmate,' shown by Mr. Guy L. Wilson.
Narcissus 'Glenmanus,' shown by Mr. W. J. Dunlop.

RHODODENDRON COMMITTEE—Col. E. H. BOLITHO, D.S.O., in the Chair, and thirteen other members present.

Awards Recommended:

Award of Merit

To *Rhododendron* 'Kiev' ('Barclayi' × *Elliottii*) (votes 10 for, 0 against), as a hardy flowering shrub, from E. de Rothschild, Esq., Exbury, nr. Southampton.
 To *Rhododendron* 'Gladys' var. 'Rose' (*campylocarpum* × *Fortunei*) (votes 7 for, 0 against), as a hardy flowering shrub, from The Commissioners of Crown Lands, Windsor Great Park, Berks.

Selected for trial at Wisley

Rhododendron (*Kurume*) 'Phyllis Elliott,' from Clarence Elliott, Esq., Rectory Farm, Moreton-in-Marsh, Glos.

Other Exhibits

R. mishniense (A.M. 1940) and *R. Championae*, from Lord Aberconway, C.B.E., LL.D., V.M.H., Bodnant, North Wales.
R. 'Alcibiades' ('Hiraethlyn' × 'F. C. Puddle'), from Lord Aberconway, C.B.E., LL.D., V.M.H., and The National Trust, Bodnant, North Wales.
R. deleiense (A.M. 1935), from Michael Haworth-Booth, Esq., Farall, Haslemere.
R. 'Spinbur' (*spinuliferum* × *burmanicum*), from The Rt. Hon. The Earl of Stair, K.T., D.S.O., Stranraer, Wigtownshire.
R. ('Romany Chal' × *Griersonianum*), from Lord Stavordale, Abbotsbury, Weymouth.

JOINT IRIS COMMITTEE—Mr. G. L. PILKINGTON, in the Chair, and six other members present.

Exhibit

Iris 'Peshawar' (*I. iberica* × *I. macrantha*) × *I. chamaeiris*, shown by H. Senior Fothergill, Esq., 12 Abercorn Place, London, N.W. 8.

JOINT ROCK GARDEN PLANT COMMITTEE—Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and eleven other members present.

Award Recommended:

Award of Merit

To *Primula eburnea*, as a hardy flowering plant for the Alpine House, from John T. Renton, Esq., Branklyn, Perth.

CHELSEA FLOWER SHOW, MAY 23, 1950

LIST OF AWARDS

Gold Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Perpetual-flowering Carnations, Border Carnations, Pinks and Dianthus Hybrids.
 To Messrs. Bakers' Nurseries, Ltd., Codsall, for an exhibit of Delphiniums and "Russell" Lupins.
 To Messrs. Barr & Sons, Covent Garden, for an exhibit of Tulips.
 To Messrs. Bees, Ltd., Chester, for an exhibit of Herbaceous Plants and Lilies.
 To Messrs. Blackmore & Langdon, Bath, for an exhibit of Delphiniums and Begonias.
 To Messrs. Carters Tested Seeds, Ltd., Raynes Park, for an exhibit of Florists' Flowers, including Sweet Peas.
 To Messrs. Charlesworth & Co., Ltd., Haywards Heath, for an exhibit of Orchids.
 To The Commissioners of Crown Lands, Windsor Great Park, for an exhibit of Azaleas, Rhododendrons and Primulas.
 To Messrs. W. A. Constable, Ltd., Tunbridge Wells, for an exhibit of Lilies and other Bulbous Plants.
 To Messrs. Dobbie & Co., Ltd., Edinburgh, for an exhibit of Sweet Peas.
 To Messrs. Dobbie & Co., Ltd., for an exhibit of Tulips.
 To Messrs. Hillier & Sons, Winchester, for an exhibit of Trees and Shrubs.
 To Messrs. Lindabruce Nurseries, Lancing, for an exhibit of Border Carnations and Pinks.
 To Messrs. McBean's Orchids, Ltd., Cooksbridge, for an exhibit of Orchids.
 To The National Farmers' Union Market Produce Show Society, Ltd., Southampton, for an exhibit of a Co-operative Display of Flowers, Vegetables and Fruit.
 To Messrs. Sanders (St. Albans), Ltd., St. Albans, for an exhibit of Orchids.

To Messrs. Sutton & Sons, Ltd., Reading, for an exhibit of Flowering Plants, chiefly Annuals.

To Messrs. Sutton & Sons, Ltd., for an exhibit of Vegetables.

To Messrs. R. Wallace & Co., Tunbridge Wells, for an exhibit of an Informal Garden.

To Messrs. R. Wallace & Co., for an exhibit of a Mixed Group of Rhododendrons, Azaleas, Lilies, Irises and Bulbous Plants.

To Mr. G. G. Whitelegg, Knockholt, for an exhibit of a Rock Garden.

To Messrs. The Winkfield Manor Nurseries, Ascot, for an exhibit of a Formal Garden.

To Messrs. The Winkfield Manor Nurseries, for an exhibit of a Rock Garden.

To Messrs. William & Wood & Son, Ltd., Taplow, for an exhibit of a Formal Garden.

Silver-gilt Flora Medal

To Mr. Percy S. Cane, 10 Lower Sloane Street, London, S.W. 1, for an exhibit of a Garden.

To Messrs. Alex. Dickson & Sons, Ltd., Newtownards, for an exhibit of Roses.

To Messrs. C. Engelmann, Ltd., Saffron Walden, for an exhibit of Carnations.

To Messrs. The Stuart Low Co., Jarvis Brook, for an exhibit of Orchids.

To Messrs. Mortlock Bros., Langley, for an exhibit of Fuchsias.

To Messrs. The Old Welwyn Gardens, Welwyn, for an exhibit of a Rock Garden.

To Messrs. Thomas Rochford & Sons, Ltd., Broxbourne, for an exhibit of Hydrangeas.

To Edmund L. de Rothschild, Esq. (gr. Mr. B. Hendy), Exbury, for an exhibit of Azaleas.

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of Ornamental Trees and Shrubs including Climbers.

To Messrs. John Waterer, Sons & Crisp, Ltd., Bagshot, for an exhibit of Rhododendrons.

To Messrs. E. Webb & Sons (Stourbridge), Ltd., Stourbridge, for an exhibit of Florists' Flowers and Annuals.

Silver-gilt Banksian Medal

To Messrs. Armstrong & Brown, Tunbridge Wells, for an exhibit of Orchids.

To Messrs. The Bartley Nurseries, Southampton, for an exhibit of Primulas.

To Messrs. Bees, Ltd., Chester, for an exhibit of Trees and Shrubs, including varieties of Clematis.

To Messrs. Walter Blom & Son, Ltd., Watford, for an exhibit of Tulips.

To Mr. D. Burkwood, Rotherfield, for an exhibit of Trees and Shrubs.

To Messrs. Benjamin R. Cant & Sons, Ltd., Colchester, for an exhibit of Roses.

To Messrs. Thomas Carlile (Loddon Nurseries), Ltd., Twyford, for an exhibit of a Mixed Group of Herbaceous and Rock Garden Plants.

To Messrs. A. Charlton & Sons, Ltd., Tunbridge Wells, for an exhibit of Trees and Shrubs.

To Messrs. Harry Dixon & Sons, Wandsworth, for an exhibit of Orchids.

To Messrs. Dobbie & Co., Ltd., Edinburgh, for an exhibit of a Mixed Group of Antirrhinums and Dahlias.

To Messrs. R. Hancock & Son, Knightsbridge, London, S.W. 1, for an exhibit of a Formal Garden.

To Messrs. Hillier & Sons, Winchester, for an exhibit of an Informal Garden.

To Messrs. Geo. Jackman & Son (Woking Nurseries), Ltd., Woking, for an exhibit of Clematis.

To Messrs. The Knap Hill Nursery, Ltd., Knap Hill, for an exhibit of Rhododendrons and Azaleas.

To Messrs. Landscape Ltd., Finchley, London, N.W. 6, for an exhibit of a Formal Lay-out.

To Messrs. Napiers Stepswater Nurseries, Ltd., Taunton, for an exhibit of Perpetual-flowering Carnations.

To Messrs. R. C. Notcutt, Ltd., Woodbridge, for an exhibit of Trees and Shrubs.

To Messrs. G. & R. Perry, Enfield, for an exhibit of Water Lilies and other Aquatics, Waterside Plants and Ferns.

Sir Henry Price (gr. Mr. R. J. Wallis), Ardingly, for an exhibit of Flowering Trees and Shrubs.

To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of Herbaceous Plants.

To Messrs. Robinsons of Chertsey, Chertsey, for an exhibit of a Formal Garden.

To Messrs. The Slieve Donard Nursery Co., Ltd., Newcastle, Co. Down, for an exhibit of Evergreen and Flowering Trees and Shrubs.

To Mr. Ian G. Walker, South Godstone, for an exhibit of an Informal Garden.

To Messrs. John Waterer, Sons & Crisp, Ltd., Twyford, for an exhibit of Herbaceous Plants.

To Mr. G. G. Whitelegg, Knockholt, for an exhibit of Irises.

To Messrs. William Wood & Son, Ltd., Taplow, for an exhibit of Herbaceous Plants.

Silver-gilt Knightian Medal

To Messrs. Toogood & Sons, Ltd., Southampton, for an exhibit of Vegetables.

Silver-gilt Lindley Medal

To L. Maurice Mason, Esq. (gr. Mr. R. Sayers), King's Lynn, for an exhibit of Species and Varieties of Begonia.

Silver Flora Medal

To Messrs. Baggens Nurseries, Pembury, for an exhibit of Trees and Shrubs.

To Messrs. Bakers' Nurseries, Ltd., Codsall, for an exhibit of Roses.

To Messrs. R. H. Bath, Ltd., Wisbech, for an exhibit of Tulips and other Bulbous Plants

To Messrs. Daniels Bros., Ltd., Norwich, for an exhibit of Tulips.

To Mr. K. W. Harle, Lower Basildon, for an exhibit of Cacti and Succulents.

To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, for an exhibit of Rock Garden Plants.

To Messrs. Geo. Jackman & Son (Woking Nurseries), Ltd., Woking, for an exhibit of Dwarf Conifers and other Plants for the Alpine House.

To Messrs. Samuel McGredy & Son, Portadown, N. Ireland, for an exhibit of Roses.

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of Fuchsias and Greenhouse Plants.

To Messrs. The Six Hills Nursery, Ltd., Stevenage, for an exhibit of Rock Garden Plants.

To Messrs. Southern Growers, Ltd., Groombridge, for an exhibit of Azaleas, Rhododendrons and other Flowering Shrubs.

To Messrs. Wheatcroft Bros., Ltd., Ruddington, for an exhibit of Roses.

To The Women's Voluntary Services, London, for an exhibit of a Garden for a prefabricated house.

Silver Banksian Medal

To Messrs. Astolat Nurseries, Ltd., Guildford, for an exhibit of Irises.

To Messrs. Thomas Baines & Sons, Billingshurst, for an exhibit of Sweet Peas.

To Messrs. Bees, Ltd., Chester, for an exhibit of Roses.

To Messrs. S. Bide & Sons, Ltd., Farnham, for an exhibit of Trees and Shrubs including Rhododendrons, Azaleas, Japanese Maples and Conifers.

To Messrs. Burkwood & Skipwith, Ltd., Kingston-on-Thames, for an exhibit of Trees and Shrubs.

To Messrs. Thomas Carlile (Loddon Nurseries), Ltd., Twyford, for an exhibit of Verbena 'Lawrence Johnston.'

To Mr. James Douglas, Gt. Bookham, for an exhibit of Border Carnations.

To Messrs. Hewitt & Co., Stratford-on-Avon, for an exhibit of Delphiniums and other Herbaceous Plants.

To Messrs. Kelway & Son, Ltd., Langport, for an exhibit of a Mixed Group of Tulips, Paconies and Pyrethrums.

To Messrs. Kew Topiary Nurseries, Richmond, for an exhibit of Clipped Box Trees, Bay Trees and Hydrangeas.

To Messrs. G. F. Letts & Sons, Hadleigh, for an exhibit of Roses

To Messrs. The Orpington Nurseries Co., Ltd., Orpington, for an exhibit of Irises.

To Messrs. Pennell & Sons, Ltd., Lincoln, for an exhibit of varieties of Clematis.

To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of Rock Garden Plants.

To Messrs. Redgrove & Patrick, Ltd., Sevenoaks, for an exhibit of a Mixed Group of Herbaceous and Rock-garden Plants.

To Messrs. G. Reuthe, Ltd., Keston, for an exhibit of Rhododendrons, Azaleas and other Flowering Shrubs.

To Mr. T. Robinson, Nottingham, for an exhibit of Miniature Roses.

To Messrs. Robinsons Gardens, Ltd., Eltham, for an exhibit of Rock Garden Plants.

To Messrs. D. Stewart & Son, Ltd., Ferndown, for an exhibit of Rhododendrons, Azaleas and Associated Plants.

To Mr. F. Street, Woking, for an exhibit of Rhododendrons.

To Messrs. R. Tucker & Son, Faringdon, for an exhibit of Roses.

To Messrs. John Waterer, Sons & Crisp, Ltd., Twyford, for an exhibit of Rock Garden Plants.

To The Waterperry Horticultural School, Wheatley, for an exhibit of Rock Garden Plants.

To Messrs. A. R. Wills, Ltd., Romsey, for an exhibit of Hydrangeas.

To Messrs. The Winkfield Manor Nurseries, Ascot, for an exhibit of Rock Garden Plants.

Silver Lindley Medal

To Messrs. The Hollybush Nurseries, Harpenden, for an exhibit of Penstemons.

Extracts from THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY

GENERAL MEETINGS

CHELSEA FLOWER SHOW, MAY 23, 1950

LIST OF AWARDS (*continued*)

Silver Hogg Medal

To Messrs. Laxton Bros. (Bedford), Ltd., Bedford, for an exhibit of Strawberries.

Flora Medal

To Messrs. Burleydam Nurseries (Chester), Ltd., Wirral, for an exhibit of Herbaceous Plants.

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of Trees and Shrubs

To Mr. James Douglas, Great Bookham, for an exhibit of Auriculas.

To Messrs. C. Gregory & Son, Ltd., Chilwell, for an exhibit of Roses

To Messrs. Haskins Bros., Ltd., Bournemouth, for an exhibit of Shrubs, including varieties of Clematis and other Climbers.

To Messrs. The Home Meadows Nursery, Martlesham, for an exhibit of Pansies, Violas and Iceland Poppies.

To Messrs. Reginald Kaye, Ltd., Carnforth, for an exhibit of Azaleas and Rock Garden Plants.

To Messrs. Kelway & Son, Ltd., Langport, for an exhibit of Irises

To Messrs. Kibble & Clare, Ltd., Ascot, for an exhibit of Rock Garden Plants.

To Messrs. Lynwood Nurseries (Teddington), Ltd., Teddington, for an exhibit of Gloxinias.

To Mr. W. J. Marchant, Wimborne, for an exhibit of Trees and Shrubs.

To Messrs. John Peed & Son, West Norwood, for an exhibit of Schizanthus and other Greenhouse Plants.

To Messrs. Read's Hybridizing Nurseries, Hockley, for an exhibit of Pansies.

To Messrs. Ryder & Son (1920), Ltd., St. Albans, for an exhibit of Herbaceous Plants.

To Messrs. Sale & Son (Wokingham), Ltd., Wokingham, for an exhibit of Rhododendrons and Azaleas.

To Messrs. Sale & Son (Wokingham), Ltd., Wokingham, for an exhibit of Rock Garden Plants.

To The Southall & District Chrysanthemum Society, Southall, for an exhibit of Greenhouse Plants.

To Messrs. The Sunningdale Nurseries, Windlesham, for an exhibit of Azaleas and Rhododendrons

To Messrs. Wakeley Bros. & Co., Ltd., North Mimms, for an exhibit of a Mixed Group of Tulips, Paeonies and Irises.

To Mr. Ian G. Walker, South Godstone, for an exhibit of a Rock Garden

To Messrs. John Waterer, Sons & Crisp, Ltd., Twyford, for an exhibit of Irises.

Banksian Medal

To Messrs. Backhouse Nurseries (York), Ltd., for an exhibit of Rock Garden Plants.

To Messrs. Bakers' Nurseries, Ltd., Codsall, for an exhibit of Rhodohypoxis and other Rock-garden Plants.

To Messrs. R. H. Bath, Ltd., Wisbech, for an exhibit of Verbenas and Calceolarias.

To Messrs. Bees Ltd., Chester, for an exhibit of Dahlias.

To Lady Bird, Solihull, for an exhibit of Hippeastrum and Streptocarpus Hybrids.

To Mr. H. A. Brown, Chingford, for an exhibit of Fuchsias.

To Messrs. Frank Cant & Co., Ltd., Colchester, for an exhibit of Roses.

To Messrs. G. & A. Clark Ltd., Dover, for an exhibit of Fuchsias.

To Messrs. G. & A. Clark Ltd., Dover, for an exhibit of Herbaceous Plants.

To Messrs. The Golden Valley Nurseries, Brimscombe, for an exhibit of Violas.

To Messrs. A. R. & K. M. Goodwin, Bewdley, for an exhibit of Rock Garden Plants, including Dwarf Shrubs.

To Messrs. Hale & May Ltd., Cookham, for an exhibit of a Mixed Group of Herbaceous Plants and Shrubs.

To Mr. Leonard S. Harbutt, Wickhambrook, for an exhibit of Trees and Shrubs, including Conifers.

To Messrs. Gavin Jones (Nurseries), Ltd., Letchworth, for an exhibit of Rock Garden Plants.

To Messrs. MacPenny Nurseries, Bransgore, for an exhibit of Rock Garden Plants.

To Messrs. MacPenny Nurseries, Bransgore, for an exhibit of a Mixed Group of Herbaceous and Rock-garden Plants.

To Mr. C. Newberry, Knebworth, for an exhibit of Anemones and Ranunculus.

To Messrs. The Old Welwyn Gardens, Welwyn, for an exhibit of Rock Garden Plants.

To Messrs. W. H. Rogers & Son, Eastleigh, for an exhibit of Dwarf Conifers and Shrubs for the Rock Garden.

To Mr. Stephen Sims, Draycott, for an exhibit of Aquilegias and Iceland Poppies.

To Messrs. Stark & Son, Ltd., Fakenham, for an exhibit of Iceland Poppies.

To Messrs. Underwood Bros., Woking, for an exhibit of Brooms.

To Messrs. Wm. Wood & Son, Ltd., Taplow, for an exhibit of Summer Bedding and Aromatic Plants.

Hogg Medal

To The Waterperry Horticultural School, Wheatley, for an exhibit of Strawberries.

FLOWERING TREE AND SHRUB COMPETITION FOR AMATEURS

Class A.—4 varieties of trees and/or Shrubs

First Prize—To Sir Henry Price, Ardingly

Second Prize—To The Commissioners of Crown Lands, Windsor Great Park.

Third Prize—To Colonel R. S. Clarke, M.P., Haywards Heath.

Fourth Prize—To Colonel F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Goring-by-Sea.

Class B.—1 vase of a tree or shrub

First Prize—To The Lord Aberconway, C.B.E., LL.D., V.M.H., and the National Trust, Bodnant.

Second Prize—To The Lord Aberconway, C.B.E., LL.D., V.M.H., and the National Trust, Bodnant.

Third Prize—To Colonel F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Goring-by-Sea.

Fourth Prize—To Colonel R. S. Clarke, M.P., Haywards Heath.

FLORAL ARRANGEMENT COMPETITION FOR PROFESSIONAL HORTICULTURISTS

First Prize—To Miss Cynthia Zorab, Winchester.

Second Prize—To Messrs. Wm. Francis, Ltd., New Malden.

Third Prize—To Miss L. Calderhead, Balham.

Fourth Prize—To Messrs. Eden (Battle), Ltd., Battle.

FLORAL ARRANGEMENT COMPETITION FOR AMATEURS

First Prize—To John B. Nicholls, Esq., 266 Cowley Road, Uxbridge, Middlesex.

Second Prize—To Mrs. Cyril Potter, Crouch Farm House, Borough Green, Kent.

Third Prize—To Mrs. Eva E. Wren, 40 Garston Lane, Kenley, Surrey.

Fourth Prize—To Mrs G. R. Bennett, The Garden House, Hatfield, Herts.

FRUIT AND VEGETABLE COMMITTEE—Mr F. A. SECRETT, C.B.E., F.L.S., V.M.H., in the Chair, and thirty-one other members present.

Exhibits

Strawberry No. 31, from G. Stanley Dunn, Esq., The Ham, Redbourn, Herts.

Rhubarb 'The Sutton,' from Chas. J. Howlett, Esq., The Yews, 309 Wokingham Road, Earley, Reading.

Unknown Rhubarb, from Chas. J. Howlett, Esq., The Yews, 309 Wokingham Road, Earley, Reading.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and twenty-four other members present.

Awards Recommended:

Preliminary Commendation and to be seen again:

To H. T. Rose 'Dorothy Anderson' (votes 24 for, 0 against), from Messrs. S. McGredy & Son, Portadown.

To H. T. Rose 'John H. Ellis' (votes 24 for, 0 against), from Messrs. S. McGredy & Son, Portadown.

To Hybrid Polyantha Rose No. 38-47 (subject to naming) (votes 20 for, 0 against), from Mr. Jan Spek, Boskoop, Holland.

Other Exhibits

Hippeastrum 'Incarnadine,' from Dr. K. Temple, Newton Abbot.

Hippeastrum 'Pradham,' from N. T. Williams, Esq., St. Buryan.

Roses 'Rubaiyat' (to be seen again); and 'Armagh,' 'Ulster Monarch,' from Messrs. McGredy & Son, Portadown.

Roses 'Fanny Blankers Koen,' 'Mary' (P.C. 1946), 'Pompon Beauty' (all to be seen again); and No. 555, 'Souv. de Jac Verschuren,' 'Yellow' Cluster' (A.M. 1949), from Mr. Jan Spek, Boskoop, Holland.

FLORAL COMMITTEE B—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H. in the Chair, twenty-five other members, and Mr. A. L. JESSOP (visitor) present.

Awards Recommended:

First-class Certificate

To *Malus ioensis plena*, as a hardy flowering tree (votes 21 for, 4 against), from Mrs. E. M. Holden, Goldwell, Newbury.

Award of Merit

To *Dicentra formosa alba*, as a hardy flowering plant (votes 13 for, 2 against), from Messrs. C. G. van Tubergen, Ltd., Haarlem, Holland.

To *Lilium Mackliniae*, as a hardy flowering plant (votes 14 for, 0 against), from Col. F. C. Stern, O.B.E., M.C., F.I.S., V.M.H., Highdown, Goring-by-Sea.

To *Paeonia arietina* var., as a hardy flowering plant (votes unanimous, subject to naming), from Miss Milne, Dykes, Henfield.

To *Paeonia* sp., as a hardy flowering plant (votes 13 for, 3 against, subject to naming), from G. S. Thomas, Esq., Briar Cottage, West End, Woking.

To *Primula* 'Viatus' (*Vitali* × *mutans*), as a hardy flowering plant (votes 20 for, 2 against), from Bartley Nurseries, Southampton.

To *Rosa anemonoides* 'Ramona,' as a hardy flowering shrub (votes unanimous), from Messrs. T. Hilling & Co., Chobham, Woking.

To *Rosa spinosissima* hybrid 'Frühlingsgold,' as a hardy flowering shrub (votes unanimous), from Messrs. T. Hilling & Co., Chobham, Woking.

To *Syringa vulgaris* 'Primrose,' as a hardy flowering shrub (votes 22 for, 2 against), from Mr. Jan Spek, Boskoop, Holland.

Other Exhibits

Acer 'Goldsworth Purple,' exhibited by Messrs. L. R. Russell, Ltd., Richmond Nurseries, Windlesham, Surrey.

Armeria plantaginea, white form, exhibited by Dr. M. Amsler, Esq., Hawkhurst.

Bambusa fastuosa, *Bambusa Metake*, *Bambusa ngra*, *Polygonatum multiflorum*, exhibited by C. J. Howlett, Esq., The Yews, 309 Wokingham Road, Earley.

Buddleia heliophila, *Olearia* × *scillomensis*, *Vallea stipularis*, exhibited by The Rt. Rev. The Lord Bishop of Truro, Las Escop, Truro.

Cercis Siliquastrum alba, *Libertia formosa*, *Piptanthus nepalensis*, *Staphylea colhuca*, exhibited by Mrs. E. M. Holden, Goldwell, Newbury, Berks.

Clematis 'Barbara Jackman,' exhibited by Messrs. Jackman & Sons, Ltd., Woking, Surrey.

Cytisus × *Burkwoodii*, exhibited by Mr. D. Burkwood, Yew Tree Lane Nurseries.

Daphne 'Somerset,' Bodnant form, *Lomatia obliqua*, exhibited by Lord Aberconway and The National Trust, Bodnant, North Wales.

Dimorphotheca chrysanthemifolia, exhibited by Messrs. Sutton & Sons, Ltd., Reading.

Libertia ixioidea, *Olearia nuda* var. *capularis*, *Pittosporum daphniphyllodes*, exhibited by Lord Stavordale, Abbotsbury Gardens, nr. Weymouth, Dorset.

Lilium Brownii, exhibited by Air Commodore Benson, Woodside House, Chenies, Rickmansworth.

Lilium Brownii var., exhibited by W. J. Keswick, Esq., Theydon Priory, Theydon Bois, Essex.

Lilium callosum var. *luteum*, exhibited by Messrs. W. A. Constable, Ltd., Southborough, Tunbridge Wells.

Lonicera tibetica, exhibited by A. T. Barnes, Esq., Kingsbrook Gardens, Cardington Road, Bedford.

Lychnis Viscaria splendens plena, exhibited by Messrs. Sale & Son, Ltd., Wokingham, Berks.

Markaya bella, exhibited by St. Bridget Nurseries, Exeter.

Malus coronaria Charlottae, exhibited by Mr. W. J. Marchant, Keeper's Hill Nursery, Stapehill, Wimborne.

Meconopsis integrifolia, *Meconopsis* × *Musgravei*, exhibited by Mrs. G. Knox Finlay, Keillour Castle, Methven, Perthshire.

Meconopsis quintuplinervia, exhibited by Messrs. Oliver & Hunter, Moniaive, Dumfries.

Petteria ramentacea, *Syringa* 'Massena,' exhibited by Col. F. C. Stern, Highdown, Goring-by-Sea, Sussex.

Penstemon alamosensis, *Penstemon campanulatus* 'Evelyn,' *Penstemon Clutei*, *Penstemon Hartwegii* 'Garnet,' *Penstemon utahensis*, exhibited by Hollybush Nurseries, Mackerye End, Harpenden, Herts.

Prunus prostrata, Syrian Form, exhibited by Capt. Collingwood Ingram, Benenden, Kent.

Syringa var., exhibited by Mrs. M. Hornby, Pusey House, nr. Faringdon, Berks.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and seventeen other members present.

Awards Recommended:

Award of Merit

Odontoglossum 'Mary' var. 'Chromos' ('Brunstone Butterfly' \times *triumphans*) (votes 17 for, 0 against), from the Hon. Mrs. Ionides, Buxted Park, Uckfield.
Cymbidium 'Clare Armstrong' var. 'Greensleeves' (*Alexanderi* \times 'Mirella') (votes 12 for, 1 against), from Messrs. Armstrong & Brown, Tunbridge Wells.
Cymbidium 'Albania' var. 'Delight' (*albanense* \times *Alexanderi*) (votes 11 for, 1 against), from Messrs. Sanders, St. Albans.
Laelocattleya 'Arcadia' (*Lc.* 'Jupiter' \times *Lc.* 'Areca') (votes 10 for, 3 against), from McBean's Orchids, Ltd., Cooksbridge.

NARCISSUS AND TULIP COMMITTEE—Mr. E. A. BOWLES, F.L.S., F.R.E.S., V.M.H., in the Chair, and sixteen other members present.

Awards Recommended:

First-class Certificate

To *Narcissus* 'Frigid,' as a variety for exhibition (votes 15 for, 0 against). This small-cupped variety (Division 3c) received an **Award of Merit** on May 20, 1947. See *Journ.* 72, p. 405. Raised and shown by Mr. Guy L. Wilson, The Knockan, Broughshane, Co. Antrim, Northern Ireland.

Award of Merit

To *Narcissus* 'Santa Claus,' as a variety for exhibition (votes 14 for, 0 against). Raised and shown by Mr. Guy L. Wilson.

Other Exhibits

Narcissus 'Reprieve,' shown by Mr. Guy L. Wilson.

RHODODENDRON COMMITTEE—Mr. CHARLES WILLIAMS, M.P., in the Chair, and thirteen other members present.

Awards Recommended:

Award of Merit

To *Rhododendron* 'Morawen' ('Isabella' 'Shepherd's Delight') (votes 12 for, 0 against), as a hardy flowering shrub, from Admiral A. Walker-Henage-Vivian, C.B., M.V.O., D.L., Clyne Castle, Blackpill, Swansea.
 To *Rhododendron* 'Conroy' (*cinnabarinum* var. *Roycei concatenans*) (votes 12 for, 0 against), as a hardy flowering shrub, from Lord Aberconway, C.B.E., L.L.D., V.M.H., and The National Trust, Bodnant, North Wales.
 To *Rhododendron* 'Winsome' ('Humming Bird' *Griersonianum*) (votes 9 for, 0 against), as a hardy flowering shrub, from Lord Aberconway, C.B.E., L.L.D., V.M.H., and The National Trust, Bodnant, North Wales.

Cultural Commendation

To The Commissioners of Crown Lands, Windsor Great Park, Berks, for a particularly fine plant of *Rhododendron* 'Hawk' var. 'Merlin' (*Wardu* 'Lady Bessborough').

Selected for trial at Wisley

Rhododendron (*Azalea*) 'Carolina' and *Rhododendron* (*Azalea*) 'Golden Eye,' from The Commissioners of Crown Lands, Windsor Great Park, Berks.
Rhododendron (*Azalea*) Nos. R.2, P.1, B.61, B.61 (A) and *Rhododendron* (*Azalea*) 'Clarissa,' from Messrs. D. Stewart & Sons, Ltd. Ferndown Nurseries, nr. Wimborne, Dorset.

R. mucronatum var. *magnificum* from Capt. Collingwood Ingram, Benenden, Kent.

Other Exhibits

R. 'Leo' (*Elliottii* 'Britannia'), *R.* ('Fusilier' *Griersonianum*), and *R.* 'Bulldog' ('Earl of Athlone' *Elliottii*), from Col. E. H. Bolitho, D.S.O., Trengwainton, Penzance, Cornwall.

R. (*Griffithianum* 'The Don') and *R. cringerum* var. *caudatum* (Forrest 25818), from Lord Digby, D.S.O., M.C., Cerne Abbey, Dorchester, Dorset.

R. 'Theresa' ('Romany Chal' \times *Griersonianum*) and *R.* 'Perseverance' ('Lady Chamberlain' \times *cinnabarinum*), from Lord Stavordale, Abbotsbury Gardens, nr. Weymouth, Dorset.

R. 'Thais' ('Euryalus' \times *Loderi*) and *R. Aberconwayi*, pink form, from Lord Aberconway, C.B.E., L.L.D., V.M.H., and The National Trust, Bodnant, North Wales.

R. 'Hawk' var. 'Exbury' (*Wardu* \times 'Lady Bessborough') and *R.* 'Repose' (*luteum* \times *discolor*), from F. de Rothschild, Esq., Exbury, Southampton.

R. (luteuse × 'Grierdal,') *R. (neriiflorum × 'Tally-Ho,')* *R. (Griffithianum × arborcum blood red)* and *R. ('Britannia' × discolor)*, from Admiral A. Walker-Henecage-Vivian, C.B., M.V.O., D.L., Clyne Castle, Blackpill, Swansea.

R. Souliei (F.C.C. 1909) *R. orbiculare* (A.M. 1922) and *R. croceum* (A.M. 1926), from Major A. E. Hardy, Sandling Park, Hythe, Kent.

R. 'Hawk' var. 'Kestrel' (*Wardii* × 'Lady Bessborough'), from The Commissioners of Crown Lands, Windsor Great Park, Berks.

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE—Mr. C. J. Horwood in the Chair, and eleven other members present.

Awards Recommended:

Award of Merit

To 'Allwood's Golden Glory' (for exhibition and market), shown by Messrs. Allwood Bros., Ltd., Haywards Heath, Sussex.

Other Exhibits

'Allwood's Prolific' (to be seen again), shown by Messrs. Allwood Bros., Ltd., Haywards Heath, Sussex.

'Market Pearl,' shown by Mr. J. R. Bell, Southdown Nurseries, Cross-in-Hand, Sussex.

JOINT DIANTHUS COMMITTEE—Mr. T. E. TOMALIN in the Chair, and twelve other members present.

Selected for trial at Wisley

Allwoodi 'Matilda,' 'Show Excellence' and 'Show Aristocrat,' all shown by Messrs. Allwood Bros., Ltd., Haywards Heath, Sussex.

JOINT IRIS COMMITTEE—Colonel F. C. STERN, O.B.E., F.L.S., V.M.H., in the Chair, and fourteen other members present.

Awards Recommended:

Award of Merit

To 'Jimmy O'Goblin' and 'Tranquil Dale,' both seedlings from *Iris inominata* × *I. Douglasiana* (votes 12 for, 0 against and 8 for, 4 against respectively), both shown by H. Senior Fothergill, Esq., 12 Abercorn Place, London, N.W. 8.

Preliminary Commendation

To *Regelio-cyclus* 'Teucros' and *Regelio-cyclus* 'Ulyssus' (votes 9 for, 0 against in each case), both shown by Messrs. C. G. van Tubergen, Ltd., Haarlem, Holland.

To 'Leprechaun' seedling from *I. inominata* × *I. Douglasiana* (votes 11 for, 0 against), shown by H. Senior Fothergill, Esq., 12 Abercorn Place, London, N.W. 8.

Selected for trial at Wisley

Regelio-cyclus 'Calchas,' 'Teucros' and 'Ulyssus,' all shown by Messrs. C. G. van Tubergen, Ltd., Haarlem, Holland.

Bearded Irises 'Juliet,' 'Lady Louise' and 'Danube Wave,' shown by Messrs. J. Kelway & Son, Langport, Somerset.

Bearded Iris 'Cornhill,' shown by N. Leslie Cave, Esq., Summerlea, Sugden Road, Thames Ditton, Surrey.

Bearded Irises 'Bridal Pink,' 'Sarah Lee Shields,' Seedlings Nos. 008 and 925, all shown by H. J. Randall, Esq., Sandilands, Woking, Surrey.

Other Exhibits

Bearded Iris, collected form of *Kochii*, shown by B. Symons-Jeune, Esq., Runnymede House, Old Windsor, Surrey.

Regelio-cyclus 'Daedalus' and 'Callisto,' both shown by Messrs. C. G. van Tubergen, Ltd., Haarlem, Holland.

Iris inominata × *I. Douglasiana* seedlings Nos. E 185 7, E 32 14 and E 185 9, all shown by H. Senior Fothergill, Esq., 12 Abercorn Place, London, N.W. 8.

Bearded Irises Nos. W 46 1, W 50 4, X 9 2, all shown by A. Drewett, Esq., 17 Beckenham Grove, Shortlands, Kent.

Bearded Irises 'Lady Mohr,' 'Brilliant Amber,' 'Chivalty,' 'Cordovan,' 'Desert Song,' 'Golden Russett,' 'Mount Timp,' 'Magic Carpet' and 'Mary Vernon,' all shown by Messrs. Kelway & Son, Langport, Somerset.

Bearded Irises Seedlings Nos. 55A and 19A, both shown by N. Leslie Cave, Esq., Summerlea, Sugden Road, Thames Ditton, Surrey.

Bearded Irises 'Nightfall,' 'Twilight Sky,' Seedlings Nos. 301, 702, 801, 812, 826, 908 and 925, all shown by H. J. Randall, Esq., Sandilands, Woking, Surrey.

Bearded Iris Seedling shown by Captain Collingwood Ingram, The Grange, Benenden, Cranbrook, Kent.

JOINT ROCK GARDEN PLANT COMMITTEE—*Iris*, Lady LAWRENCE, in the Chair, and eight other members present.

Awards Recommended:

Award of Merit

To *Vaccinium Delavayi*, as a hardy flowering shrub for the Alpine House and Rock Garden, from R. E. Heath, Esq., 13 Maybury Close, Petts Wood, Kent.

To *Campanula paha*, as a hardy flowering plant for the Alpine House and Rock Garden, from H. Clifford Crook, Esq., 4 Alexandra Crescent, Bromley, Kent.

Preliminary Commendation

To *Primula tenella*, from Mrs. G. Knox Finlay, Keillour Castle, Methven, Perthshire, To *Primula* 'Prospect' (*Wollastonii* × *Reidii*) from R. B. Cooke, Esq., Kilbryde, Corbridge, Northumberland.

Other Exhibits

Edraianthus graminifolius and *Viola Curtisii* from C. H. Hammer, Esq., The Old Rectory, Boreham, Essex.

Primula umbratilis (A.M. 1941), *Aconitum Hookeri* and *Primula Dickieana*, which the Committee wishes to see again at a future meeting, from R. B. Cooke, Esq., Kilbryde, Corbridge, Northumberland.

Pentstemon fruticosus var. *Scouleri*, which the Committee wishes to see at a future meeting, *Pentstemon fruticosus* var. *crassifolius* and *Pentstemon congestus* from Alexander MacGregor, Esq., Hollybush Nurseries, Mackerye End, Harpenden, Herts.

Erigeron glaucus roseus 'MacPenny,' from Messrs. MacPenny Nurseries, Ltd., Bransgore, nr. Christchurch, Hants.

Primula vulgaris green-form, from Lt.-Col. L. H. Brammall, Alpine Nursery, Nomansland, nr. Salisbury.

JUNE 6, 1950

JOINT IRIS COMMITTEE—Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and fourteen other members present.

Selected for trial at Wisley

Seedling 70/5 and 'Keene Valley,' from L. W. Brummitt, Esq., 30 Bloxham Road, Banbury, Oxon.

Seedling, from A. T. White, Esq., Aldbury, Oaklands Avenue, Oxhey, Herts.

'Truly Yours,' 'Corporal Mary,' 'Sarah Goodloe,' 'New Horizon' and 'Robin McGregor,' from H. J. Randall, Esq., Sandilands, Brooklyn Road, Woking, Surrey. Seedlings CM 1100 and CM 1110, from Sir Cedric Morris, Benton End, Hadleigh, Suffolk.

'St Dominic,' from Rev. Canon Rollo Meyer, Manor End, Little Gaddesden, Berkhamsted, Herts.

'Cascade Splendor,' 'Three Oaks' and 'Indiana Night,' from C. P. Raffill, Esq., 193 Kew Road, Richmond, Surrey.

'Pinnacle' and 'Melody Lane,' from G. L. Pilkington, Esq., Lower Lee, Woolton, Liverpool.

'Strathmore,' from Messrs. R. W. Wallace & Co., The Old Gardens, Tunbridge Wells, Kent.

Other Exhibits

'Rare Marble' and 'Sea Lark,' from H. Senior Fothergill, Esq., 32 Old Burlington Street, London, W.1.

Seedling 805AA, from N. I. Cave, Esq., Summerlea, Sugden Road, Thames Ditton, Surrey.

Seedling H.1, 46 2A and 45-25A, from L. W. Brummitt, Esq., 30 Bloxham Road, Banbury, Oxon.

JUNE 13, 1950

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and nine other members present.

Arillode of Scilla Thunbergiana, etc.—Mr. W. T. Stearn reported that he had found ants carrying the seeds of this *Scilla* for a considerable distance and devouring the arillode which appeared to be of a sugary nature. As Col. Stern remarked, the same thing occurs with the seeds of *Galanthus*.

Rogue Wallflower.—Prof. Barnes showed a specimen of this peculiar form in which only sepals and carpels are developed (see JOURNAL R.H.S. 40, 85). A peculiarity not before noted was that in some instances in Prof. Barnes' plants an axillary shoot had grown in the axil of a sepal.

Allium atropurpureum.—Sir Cedric Morris, of Hadleigh, Suffolk, sent flowers of this tall species of Allium, a native of Hungary eastwards, with dense, almost globular heads of dark purple flowers. It belongs to the group of Alliums in which more than two ovules are seen in sectioning a cell of the ovary.

Lonicera glaucescens.—Sir Cedric Morris also sent flowering shoots of *Lonicera glaucescens*, a native of the middle regions of North America, with large glaucous rounded leaves connate beneath the yellow flowered inflorescence.

Silver Firs coming.—Commander Gilliland drew attention to the coming of the following species of Abies in his garden at Londonderry this year: *A. cephalonica*, planted 1932; *A. firma*; *A. grandis*, planted 1919; *A. koreana*, planted 1934, female cones regularly produced, male for the first time; *A. numidica*, planted 1932; *A. Veitchii* (var. *olivacea*?), planted 1941.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended*Gold Medal*

To Messrs. Robert Bolton & Son, Birdbrook, for an exhibit of Sweet Peas.

Silver-gilt Banksian Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Garden Pinks and *Dianthus Allwoodii*.

To Landabruce Nurseries, Lancing, for an exhibit of Garden Pinks.

To Messrs. John Peed & Son, West Norwood, for an exhibit of Gloxinias.

To Queenswood School (gr. Mr. G. H. Symonds), Hatfield, for an exhibit of Calceolarias

To Messrs. John Waterer, Sons & Crisp, Ltd., Twyford, for an exhibit of Paeonies.

Silver Flora Medal

To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of herbaceous plants

To Messrs. Kelway & Son, Ltd., Langport, for an exhibit of Paeonies and Delphiniums.

To Messrs. Sutton & Sons, Ltd., Reading, for an exhibit of Sweet Peas.

Silver Banksian Medal

To Messrs. Walter Blom & Son, Ltd., Watford, for an exhibit of Dutch Irises.

To Messrs. G. & A. Clark, Ltd., Dover, for an exhibit of herbaceous plants.

To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of herbaceous plants.

To Messrs. R. Wallace & Co., Tunbridge Wells, for an exhibit of Irises and Eremurus.

To Mr. G. G. Whitelegg, Knockholt, for an exhibit of Irises.

Flora Medal

To Messrs. J. P. de Goede Sz, Breezand, Holland, for an exhibit of Dutch Irises

To Orpington Nurseries Co., Ltd., Orpington, for an exhibit of Irises.

To Messrs. Sale & Son (Wokingham), Ltd., Wokingham, for an exhibit of Roses.

To Telston Nurseries, Telston, for an exhibit of Regal Pelargoniums.

Banksian Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations and various *Dianthus*.

To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of Verbena 'Lawrence Johnston.'

To Messrs. Hale & May, Ltd., Cookham, for an exhibit of herbaceous plants and alpines.

To Mr. L. S. Harbutt, Wickhambrook, for an exhibit of herbaceous plants.

To Messrs. G. Longley & Sons, Rainham, for an exhibit of Roses.

To Mr. C. Newberry, Knebworth, for an exhibit of Pinks and Ranunculus.

To Messrs. Ryder & Son (1920) Ltd., St. Albans, for an exhibit of Paeonies and Delphiniums.

To Messrs. Stark & Son, Ltd., Fakenham, for an exhibit of Iceland Poppies.

To Messrs. Wakeley Bros. & Co., Ltd., North Mymms, for an exhibit of herbaceous plants.

Other Exhibits

Roses and Violas, from Mr. C. A. Jardine, Feltham.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and seventeen other members present.

Awards Recommended

Silver Flora Medal

To Messrs. W. A. Constable, Ltd., Southborough, for an exhibit of Lilies, Irises, Alstroemerias and other bulbous plants.

To Mr. F. Street, Woking, for an exhibit of hardy hybrid Rhododendrons.

Silver Banksian Medal

To Messrs. Burkwood & Skipworth, Ltd., Kingston-on-Thames, for an exhibit of flowering shrubs.

To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, for an exhibit of rock garden plants.

To Messrs. Robinson, Eltham, for an exhibit of rock garden plants.

Flora Medal

To Messrs. Feilden & Crouch, Wrotham, for an exhibit of rock garden plants.

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of greenhouse shrubs and plants.

Banksian Medal

To Messrs. Walter Blom & Son, Ltd., Watford, for an exhibit of forms of *Lilium longiflorum*.

To East Lodge Gardens, Enfield, for an exhibit of rock garden plants.

To Kew Topiary Nursery, Richmond, for an exhibit of clipped Box and Bay trees.

To Messrs. Sale & Son, Ltd., Wokingham, for an exhibit of flowering shrubs.

To Verulam House Nursery, St. Albans, for an exhibit of rock garden and border plants.

Award of Merit

To *Allium albopilosum*, as a hardy, flowering herbaceous plant (votes 14 for, 0 against), from Sir Cedric Morris, Benton End, Hadleigh.

To *Rosa* 'Wedding Day' (*R. Sinowilsoni* \times *R. Moyesii*, selfed), as a hardy flowering shrub (votes 11 for, 0 against), from Col. F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Highdown, Goring-by-Sea.

To *Rhododendron* 'Angelo' var. 'Sheffield Park' (*R. discolor* \times *R. Griffithianum*) as a hardy, flowering shrub (votes 12 for, 0 against), from Capt. A. Granville Soames, O.B.E., Sheffield Park, Uckfield, Sussex.

To *Rhododendron* 'Rouge' (*R. T.L. 1249* \times *R. Elliottii*), as a hardy flowering shrub (votes 15 for, 0 against), from E. de Rothschild, Esq., Exbury, Southampton.

Preliminary Commendation

To *Lilium* hybrid (*L. candidum* \times *L. testaceum*), as a hardy flowering herbaceous plant (votes unanimous, subject to naming), from Messrs. W. A. Constable, Ltd., Southborough.

To *Rhododendron* 'Jan Steen' (*R. 'Fabia'* \times *R. 'Lady Bessborough'*), as a hardy flowering shrub (votes unanimous), from E. de Rothschild, Esq., Exbury, Southampton.

Other Exhibits

Allium atropurpureum, *A. multibulbosum*, *Lonicera glaucescens*, exhibited by Sir Cedric Morris, Benton End, Hadleigh.

Alstroemeria \times 'Walter Fleming,' exhibited by Messrs. R. Wallace & Co., Tunbridge Wells.

Berberis sp., exhibited by Mr. M. Nicholson, 'Cala,' Kingston, Taunton.

Callistemon pallidus, exhibited by Lord Stavordale, Abbotsbury, near Weymouth.

Chrysanthemum praeteritum, exhibited by Mrs. A. N. Griffith, Paradise House, Newnham, Cambridge.

Hydrangea macrophylla var. 'Maréchal,' exhibited by Mr. M. Haworth-Booth, Farall Nurseries, Haslemere.

Lilium auratum var. 'Pauline Tuffery,' exhibited by Messrs. W. A. Constable, Ltd., Southborough.

Magnolia tripetala, exhibited by Sir George Jessel, Bt., Ladham House, Goudhurst.

Rosa foetida var. *persiana*, exhibited by Miss C. Beck, 'The Cottage,' Great Arnwell, Ware.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and ten other members present.

Award of Merit

Odontioda 'Marisperm' var. 'Dainty' (*Oda*. 'Marie Antoinette' \times *Odm. crispum*) (votes 10 for, 0 against), from Messrs. Charlesworth & Co., Haywards Heath.

Odontoglossum 'Princess Elizabeth' ('Faustina' \times *crispum*) (votes 10 for, 0 against), from Messrs. Charlesworth & Co., Haywards Heath.

Cultural Commendation

To Mr. H. Ferdi, 164 Uxbridge Road, Hampton Hill, London, for a well-cultivated plant of *Brassia verrucosa*, bearing nine spikes with a total of 95 flowers.

JOINT DELPHINIUM COMMITTEE Mr. T. CARLILE in the Chair, and six other members present.

Exhibits

Seedling from A. E. J. B. Kidney, Esq., 11 Osterley Gardens, Thornton Heath, Surrey. Seedlings A 3 50, A 4 50, A 1 50 and A 2 50 from Mrs. A. Y. S. Skimming, Taplow House, Taplow, Bucks.

Seedling from Hulbert White, Esq., 51 Summerheath Road, Haulsham.

JOINT DIANTHUS COMMITTEE—Mr. F. R. McQuown in the Chair, and thirteen other members present.

Awards Recommended

Award of Merit

To 'Show Pearl' (for exhibition), 'Show Discovery' (for exhibition), shown by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath.

To 'William Brownhill' (for exhibition), shown by Messrs. T. Carlile Ltd., Loddon Nurseries, Twyford, Berks.

Selected for trial at Wisley

Allwoodii 'Faith,' 'Show Pearl,' 'Show Discovery' and Allwoodii 'Hope,' shown by Messrs. Allwood Bros. Ltd., Wivelsfield Nurseries, Haywards Heath.

'Cottage Loveliness,' shown by R. E. Gardiner, Esq., Iles Close, Far Oakridge, Stroud, Glos.

'William Brownhill,' shown by Messrs. T. Carlile, Ltd., Loddon Nurseries, Twyford, Berks.

Other Exhibits

'Phoenix,' shown by W. R. Gray, Esq., 54 Singleton Road, Dagenham, Essex.

'Pretty Polly,' 'Joey,' 'Mrs. Cranfield-Parker,' 'Mrs. A. E. Wells,' 'Duffy,' 'Jack Cranfield-Parker,' 'Nicky,' 'James S. Wells,' 'Mary Lowe Hall Wells,' 'Red Petrel,' 'Mitzy,'

'Christchurch Salmon,' 'June Morning,' 'Red Eye,' 'Pink Frill,' 'Mrs. Ellen Cane,' and 'Sidney P. Wells,' all shown by Messrs. S. P. Wells, Castle Nurseries, Muscliff Lane, Moordown, Bournemouth.

JOINT IRIS COMMITTEE—Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and nine other members present.

Awards Recommended

Award of Merit

To *Iris spuria Lilacina* (votes 8 for, 0 against), shown by Col. F. C. Stern, Highdown, Goring-by-Sea.

Other Exhibits

Iris foetidissima 'Pichard's Superb,' from Messrs. M. Pichard & Sons, Ltd., Christchurch, Hants.

Iris sibirica 'Tycoon' and *I. chrysographes* 'Kermes,' from Messrs. R. Wallace & Co., Tunbridge Wells, Kent.

Bearded Iris 'Pale Primrose' (A.M. 1950), from The Orpington Nurseries Co. Ltd., Orpington, Kent.

JOINT ROCK GARDEN PLANT COMMITTEE—Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and eleven other members present.

Exhibit

Scutellaria scordiifolia, from Frank Barker, Esq., Six Hills Nursery, Stevenage, Herts.

JUNE 27, 1950

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and three other members present.

Bean Seed Fly attacking Gladiolus—Mr. G. Fox Wilson showed specimens of the bean seed fly (*Delia clicrura*) and reported that the greater number of 250 gladiolus corms at Staplehurst failed to develop owing to the destruction of the young shoots by the larvæ of this species during early June. As many as 10 larvæ had been found on a corm. The flies emerged from the 17th June onwards. This attack indicated an extension of host-range by *Delia clicrura*.

Capsid Bug attacking Magnolia.—Mr. G. Fox Wilson also recorded a new host for the common green capsid bug (*Iygus pabulinus*) which had severely damaged the young leaves and growths of *Magnolia grandiflora* at Sanderstead during June.

Strawberry with reddish petals.—A half-mature strawberry sent by Mrs. Winifred D. Dixon, of Harrow, had rose-coloured petals still persisting. They had opened rose and all the flowers on the plant were reported to be similarly coloured. Mr. G. Fox Wilson said that since rose colouring of the plants sometimes indicated nematode infection it would be desirable to have this examined at Wisley.

Apetalous Sempervivum octopodes.—The Committee examined with interest a form of *Sempervivum octopodes* having carpels but no petals or stamens, exhibited by Mrs. A. N. Griffith, of Newnham, Cambridge.

Lupinus Paynei.—Mr. E. A. Bowles put before the Committee an herbaceous lupin of bushy habit which grew up to 6 feet and more in his garden. It had a stout hollow main stem, light green leaves with eight narrowly oblanceolate leaflets to 9 cm. long, glabrous above but minutely pubescent beneath, and loose foot-long inflorescences of mostly whorled pale violet flowers about 1.7 cm. long with a short (about 5 mm. long) pubescent pedicel, glabrous standard and ciliated keel. This plant had been introduced by Lady Byng from California and was grown under the name *L. Paynei*, which seemed not to be correct. It appeared very like *L. rivularis*. Specimens were referred to the Royal Botanic Gardens, Kew.

Delphinium orientale and *D. Ajacis*.—Mr. W. T. Stearn showed specimens of the annual larkspurs, *Delphinium Ajacis* L. sec. J. Gay (*D. Gavatum* Willmott) and *D. orientale* J. Gay (*D. Ajacis* L. sec. Willmott) grown in his garden at Kew, together with horticultural forms from Messrs. Sutton. *D. Ajacis* and *D. orientale*, though closely allied, were distinguishable by a number of associated characters; thus the side branches spread more widely in *D. Ajacis* than in *D. orientale*, which is of rather fastigate habit, and the spur is much longer in *D. Ajacis* than in *D. orientale*. There are also differences in hair-covering and capsule. A Swedish geneticist Beckman had made over 2,000 cross-pollinations without obtaining a single hybrid. Examination of the garden larkspurs exhibited showed that some were derived from *D. Ajacis* and others from *D. orientale*. It seemed evident that the two species have developed parallel forms, and statements that the annual larkspurs are wholly derived from one or the other species are not correct.

Plants for Identification.—A pink-flowered Amaryllid from Lord Aberconway and the National Trust was identified as *Habranthus robustus*. It was suggested that a conifer shown by Iris Lady Lawrence might be *Cryptomeria japonica* var. *dacrydioides*.

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRETY, C.B.E., F.L.S., V.M.H., in the Chair, and ten other members present.

Awards Recommended

First-Class Certificate

To Strawberry 'Auchincruive Climax' (voting unanimous), from the National Fruit Trials, Wisley, Ripley, Surrey, as a first-class mid-season variety which was bred for resistance to red-core by R. D. Reid, Esq., West of Scotland Agricultural College, Auchincruive, Ayr.

Selected for Trial

Strawberry 'Cambridge Seedlings,' Nos. 54, 448, 456, 503, 641, from Kingsley Fruit Farm & Nursery, Ltd., Kingsley, Bordon, Hants.

Other Exhibits

Strawberry 'Cambridge Seedling' No. 365, from Kingsley Fruit Farm & Nursery, Ltd., Kingsley, Bordon, Hants.

Group of Strawberries, from The Pinetree Fruit Farm Cranborne, Wimborne, Dorset.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and twenty other members present.

Awards Recommended*Gold Medal*

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Delphiniums.

Silver-gilt Banksian Medal

To Lindabruce Nurseries, Lancing, for an exhibit of Pinks and Border Carnations.

To Messrs. Wheatcroft Bros., Ltd., Ruddington, for an exhibit of Roses.

Silver Flora Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Border Carnations and *Dianthus Allwoodii*.

To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of herbaceous plants.

To Messrs. John Peed & Son, West Norwood, for an exhibit of Gloxinias.

To Messrs. John Waterer, Sons & Crisp, Ltd., Twyford, for an exhibit of Roses.

Silver Banksian Medal

To Mr. L. S. Harbutt, Wickham Brook, for an exhibit of herbaceous plants.

To Messrs. Kelway & Son, Ltd., Langport, for an exhibit of Paeonies and Delphiniums.

To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of herbaceous plants.

To Messrs. E. Webb & Sons (Stourbridge) Ltd., Stourbridge, for an exhibit of Sweet Peas

Flora Medal

To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of *Dianthus* 'William Brownhill.'

To Messrs. George Longley & Son, Rainham, for an exhibit of Roses.

To Messrs. R. & E. Ratcliffe, Chilton, for an exhibit of Roses.

To Messrs. Sale & Son (Wokingham) Ltd., Wokingham, for an exhibit of Roses.

To Messrs. E. W. Stedman, Ltd., Longthorpe, for an exhibit of Roses.

Banksian Medal

To Hollybush Nurseries, Harpenden, for an exhibit of Penstemons.

To Gavin Jones Nurseries, Ltd., Letchworth, for an exhibit of *Alstroemerias*

To Mr. J. W. Read, Hocklev, for an exhibit of *Chrysanthemum maximum* 'Esther Read.'

To Messrs. Wakeley Bros. & Co., Ltd., London, for an exhibit of herbaceous plants.

Award of Merit

To Rose 'Claude' (votes 8 for, 4 against), from Messrs. Wheatcroft Bros., Ltd., Ruddington.

To Rose 'Monique' (votes 16 for, 0 against), from Messrs. Wheatcroft Bros., Ltd., Ruddington.

To Rose 'Sultane' (votes 12 for, 2 against), from Messrs. Wheatcroft Bros., Ltd., Ruddington.

Selected for trial at Wisley

Campanula persicifolia 'Windsor Belle,' from Mr. F. A. Bishop, Oaken, Wolverhampton.

Border Carnation 'Cottage Salmon,' from Messrs. Allwood Bros., Ltd., Haywards Heath.

Border Carnation 'Cottage Triumph,' from Messrs. Allwood Bros., Ltd., Haywards Heath.

Border Carnation 'Downs Flame,' from Messrs. Allwood Bros., Ltd.

Delphinium, White Seedling No. 5, from C. J. Howlett, Esq., Earley, Reading.

Other Exhibits

Achillea 'Moonlight,' from the Principal, Essex Institute of Agriculture, Chelmsford.

Carnation 'Ramparts Red,' from Mrs. P. R. Underwood, Colchester.

Delphiniums, from Messrs. Sutton & Sons, Ltd., Reading.

Pinks, Anemones and Lavender, from Mr. C. Newberry, Knebworth.

Roses 'Eden Rose' and 'Grandmere Jenny' (A.M. 1949), from Messrs. Wheatcroft Bros., Ltd., Ruddington.

Roses and Violas from Mr. C. A. Jardine, Feltham.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and twenty other members present.

Awards Recommended

Silver Flora Medal

To Messrs. W. A. Constable, Ltd., Southborough, for an exhibit of Lilies, Irises, Alstroemerias and other bulbous plants.

To Sir Henry Price, Ardingly, for an exhibit of flowering shrubs.

Silver Banksian Medal

To Messrs. R. Wallace & Co., Tunbridge Wells, for an exhibit of Lilies, Eranthus and other hardy flowering plants.

Flora Medal

To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.

To Mr. M. Haworth-Booth, Haslemere, for an exhibit of Hydrangeas.

To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, for an exhibit of rock garden plants in pots.

To Old Court Nurseries, Colwall, for an exhibit of shrubs, border and rock garden plants.

To Old Welwyn Gardens, Welwyn, for an exhibit of rock garden plants.

To Messrs. Robinson, Eltham, for an exhibit of rock garden plants.

Banksian Medal

To Messrs. Burkwood & Skipwith, Kingston-on-Thames, for an exhibit of flowering shrubs.

To East Lodge Gardens, Enfield, for an exhibit of rock garden plants.

To Mr. F. Street, Woking, for an exhibit of Rhododendrons, Kalmas and other flowering shrubs.

Award of Merit

To *Eucalyptus Gunnei*, as a hardy tree (votes unanimous), from Messrs. C. H. Taudevin, Willaston.

To *Lilium* 'Dunkirk,' as a hardy flowering plant (votes unanimous), from W. Bentley, Esq., Quarry Wood, Newbury.

To *Lupinus* ? *Paynei*, as a hardy flowering plant (votes 12 for, 0 against, subject to verification of name), from E. A. Bowles, Esq., M.A.; F.L.S., V.M.H., Myddleton House, Enfield.

To *Rhododendron* 'Francis Hanger' (*dichroanthum* - 'Isabella'), as a hardy flowering shrub. (Votes 12 for, 0 against), from E. de Rothschild, Esq., Exbury.

To *Rhododendron* 'Inamorata' (*Wardii* × *discolor*) as a hardy flowering shrub (votes unanimous), from E. de Rothschild, Esq., Exbury.

Preliminary Commendation

To *Lilium* hybrid 401410, as a hardy, flowering herbaceous plant (votes unanimous, subject to naming), from Messrs. W. A. Constable, Ltd., Southborough.

Other Exhibits

Blandfordia marginata, *Manglietia insignis*, *Rosa longicuspis*, exhibited by Lord Aberconway, C.B.E., LL.D., V.M.H., Bodnant, N. Wales.

Cornus Kousa var. *chinensis*, exhibited by Col. F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Highdown, Goring-by-Sea, Sussex.

Cotonaster lactea, exhibited by M. Ogilvie-Grant, Esq., 71 Kew Green, Surrey.

Eucalyptus Dalrympleana, *E. coccifera*, exhibited by Messrs. C. H. Taudevin, Raby Nurseries, Willaston, Cheshire.

Lilium Hybrid 43/52 N.S., exhibited by W. Bentley, Esq., Quarry Wood, Burghclere, Newbury.

Lilium × *Marhan* 'J. S. Dijt,' *Lilium* × *Marhan* A. 2, exhibited by Mr. H. C. Dijt, Lehelckwekerij 'Westergeest,' Den Burg, B 62, Texel, Holland.

Lilium 'Old Gold,' *L.* 'Redbird,' *L.* 'Valiant,' exhibited by Messrs. W. A. Constable, Ltd., The Lily Gardens, Southborough.

Rhododendron 'Retreat,' *R.* 'Reverie,' *R. Thayerianum*, exhibited by E. de Rothschild, Esq., Exbury.

Rhododendron rhabdotum, exhibited by The Earl of Limerick, Chiddinglye, West Hoathly, E. Grinstead.

Rose 'Agnes,' *Veronica* Spender's Seedling, exhibited by Messrs. T. Hilling & Co., The Nurseries, Chobham.

Rose 'Hiawatha' sport, exhibited by A. T. Barnes, Esq., Kingsbrook Gardens, Cuddington Road, Bedford.

Extracts from THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY

GENERAL MEETINGS

JUNE 27, 1950

JOINT DELPHINIUM COMMITTEE—Mr. T. HAY, C.V.O., V.M.H., in the Chair, and seven other members present.

Selected for trial at Wisley

'Royalist,' shown by Messrs. Blackmore & Langdon, Bath.

Other Exhibits

'Frederick Grisewood' (selected for trial 1946) and 'Startling' (selected for trial 1949), shown by Messrs. Blackmore and Langdon, Bath.

Belladonna 'Fairy Wings,' shown by W. A. Hawkes, Esq., The Moat House, Holwell, Hitchin, Herts.

JOINT DIANTHUS COMMITTEE—Mr. G. MUNRO, C.B.E., V.M.H., in the Chair, and eight other members present.

Exhibits

'Margaret Curtis' and 'Daydawn' (selected for trial 1948), shown by Messrs. W. E. Th. Ingwersen, Ltd, East Grinstead, Sussex.

JOINT IRIS COMMITTEE—Mr. G. L. PHILKINGTON in the Chair, and seven other members present.

Selected for trial at Wisley

Iris ochroleuca (Ephesus), shown by C. W. Christie-Miller, Esq., Swyncombe House, Henley-on-Thames.

JOINT ROCK GARDEN PLANT COMMITTEE Col. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., in the Chair, and ten other members present.

Awards Recommended

Award of Merit

To *Campanula garganica* var. *fenestrellata*, as a hardy flowering plant for the rock garden or alpine house, from Mrs. A. N. Griffith, Paradise House, Newnham, Cambridge.

To *Sempervivum arachnoideum* var. *Laggeri*, as a hardy flowering plant for the rock garden or alpine house, from W. Howell, Esq., Town Hall, Beckenham, Kent.

Other Exhibits

Androsace alpina, from G. H. Berry, Esq., The Highlands, Ridgeway, Enfield, Middx. *Sempervivum octopodes apetalum*, which was referred to the Scientific Committee, from Mrs. A. N. Griffith, Paradise House, Newnham, Cambridge.

Campanula hercegovina var. *nana* (A.M. 1946), from E. W. Sandford, Esq., 99 Leander Road, Thornton Heath, Surrey.

JUNE 28, 1950

JOINT DELPHINIUM COMMITTEE—Mr. T. HAY, C.V.O., V.M.H., in the Chair, and nine other members present.

Selected for trial at Wisley

'Elizabeth Schumann,' shown by C. R. Wootton, Esq., 119 Lichfield Road, Bloxwich, Walsall.

JULY 11, 1950

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and three other members present.

Fasciated Gaillardia.—Mrs. V. A. Simonsen of Wood Green sent a fasciated *Gaillardia* bearing two flowers joined together at the end of its stem. The Committee examined this with interest.

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRETT, C.B.E., F.L.S., V.M.H., in the Chair, and twenty-four other members present.

Exhibits

Collection of Soft Fruit varieties from the National Fruit Trials, Wisley, Ripley, Surrey. Lettuce 'Great Lakes' and Seakale Beet 'Fordhook Giant' from Mrs. H. W. Hall, Downton Fields, Hordle, Lymington, Hants.

FLORAL COMMITTEE A—Mr. G. W. Leak, V.M.H., in the Chair, and sixteen other members present.

Awards Recommended:

Silver-gilt Flora Medal

To Messrs. Blackmore & Langdon, Bath, for an exhibit of herbaceous plants.
To Messrs. E. Webb & Sons (Stourbridge) Ltd., Stourbridge, for an exhibit of Sweet Peas and Larkspurs.

Silver-gilt Banksian Medal

To Messrs. Thomas Carlile, Ltd., Twyford, for an exhibit of herbaceous plants
To Messrs. S. McGredy & Son, Portadown, for an exhibit of Roses.

Silver Banksian Medal

To Messrs. Frank Cant & Co., Colchester, for an exhibit of Roses.
To Messrs. Daniels Bros., Ltd., Norwich, for an exhibit of Roses, Sweet Peas and Larkspurs.
To Messrs. R. & E. Ratcliffe, Chilton, for an exhibit of Roses.
To Messrs. E. W. Stedman, Ltd., Longthorpe, for an exhibit of Roses.
To Suffolk Seed Stores Ltd., Woodbridge, for an exhibit of herbaceous plants.
To Messrs. Wheatcroft Bros., Ltd., Ruddington, for an exhibit of Roses.

Flora Medal

To Messrs. A. Dickson & Sons, Ltd., Newtownards, for an exhibit of Roses.
To Mr. E. B. Le Grice, North Walsham, for an exhibit of Roses.
To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of herbaceous plants.
To Messrs. Wakelev Bros. & Co., Ltd., London, for an exhibit of herbaceous plants
To Messrs. A. Warner & Son, Boxted, for an exhibit of Roses

Banksian Medal

To Messrs. B. R. Cant & Sons, Ltd., Colchester, for an exhibit of Roses
To Messrs. Hale & May, Ltd., Cookham, for an exhibit of herbaceous plants and Roses
To Mr. A. Miles, Bickley, for an exhibit of herbaceous plants
To F. T. S. Staggs, Esq., Woodford Green, for an exhibit of Coleus

Award of Merit

To Begonia 'Shirley Desire,' as a greenhouse flowering plant (votes 8 for, 2 against), from Messrs. H. Woolman, Ltd., Shirley, Birmingham.
To Rose 'Eden Rose' (votes 16 for, 0 against), from Messrs. Wheatcroft Bros., Ltd., Ruddington.
To Rose 'Moonbeam' (votes 12 for, 0 against), from Mr. H. Robinson, Hinckley, Leicester.
To Rose 'Yves Laticulle' (shown as 'Mme. Yves Laticulle') (votes 16 for, 0 against), from Messrs. Wheatcroft Bros., Ltd., Ruddington.

Selected for trial at Wisley

Chrysanthemum maximum 'Jennifer Read,' from Mr. F. G. Read, Deopham, Norfolk.
Petunia 'Fire Chief,' from Mrs. H. W. Hall, Lymington, Hants.
Hemerocallis seedlings RC/A and CR/A, from N. L. Cave, Esq., Thames Ditton.

Other exhibits

Carnations 'Thornton Scarlet' and 'Thornton Yellow' (to be seen again), from Mr. E. A. Tickle, Thornton Heath.
Chrysanthemum Parthenium fl. pl., from F. Buckland, Esq., Bexley Heath.
Hardy plants, from Mr. C. Newberry, Knebworth.
Roses and Violas, from Mr. C. A. Jardine, Feltham.
Salvia seedling, from Mr. W. Clapham, Otford.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and twenty-one other members present.

Awards Recommended:

Gold Medal

To Messrs. W. A. Constable, Ltd., Southborough, for an exhibit of Lilies, *Alstroemerias* and other hardy flowering plants.
To Messrs. R. Wallace & Co., Tunbridge Wells, for an exhibit of Lilies, *Eremurus*, *Alstroemerias* and other hardy flowering plants.

Flora Medal

To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.
To Messrs. Robinson, Eltham, for an exhibit of rock garden plants.

Banksian Medal

To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of flowering shrubs.
 To East Lodge Gardens, Enfield, for an exhibit of rock garden plants.
 To Hollybush Nurseries, Harpenden, for an exhibit of rock garden plants.
 To Kew Topiary Nurseries, Ltd., Richmond, for an exhibit of clipped trees.

Award of Merit

To *Lavandula Spica nana atropurpurea*, as a hardy, flowering shrub (votes unanimous), from Messrs. Thos. Carlile (Loddon Nurseries) Ltd., Twyford, Berks.
 To *Lilium* 'Ann Constable,' as a hardy, flowering herbaceous plant (votes unanimous), from Messrs. W. A. Constable, Ltd., Southborough.

Selected for trial at Wisley

Lilium 'Green Flush' exhibited by Messrs. W. A. Constable, Ltd.

Other Exhibits

Digitalis orientalis, *Lychnis chalconica plena*, exhibited by Messrs. M. Prichard & Sons, Ltd., Christchurch.
Hydrangea acuminata var. 'Bluebird,' *H. macrophylla* var. 'Anni Pasquier,' *H. macrophylla* var. 'Bluewave,' *H. serrata* var. *macrosepala*, exhibited by Mr. M. Haworth-Booth, Haslemere.
Lavandula 'Loddon Pink,' exhibited by Messrs. Thomas Carlile (Loddon Nurseries) Ltd., Twyford.
Lilium Bolanderi, *L. parvum* - *Parryi*, exhibited by W. Bentley, Esq., Newbury.
Lilium 'Lady Eve Price,' exhibited by Messrs. W. A. Constable, Ltd., Southborough.
Lilium 'Parkmannii' var. 'Delmonden Ruby,' exhibited by Dr. Maurice Amsler, Hawkhurst.
Styrax philadelphoides, exhibited by Capt. Collingwood Ingram, Benenden.
 Collection of Lilies, exhibited by the Oregon Bulb Farms, Gresham, Oregon.
 Collection of Spiraeas and Astilbes, exhibited by Mr. F. Street, West End, Woking.

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and six other members present.

Award Recommended**Cultural Commendation**

To Mr. James W. Rose, Orchid grower to J. V. Rank, Esq., Ouborough, Godstone, for a large plant of *Coeloglym Dayana* bearing thirteen pendulous spikes and a total of over 500 flowers.

JOINT BORDER CARNATION COMMITTEE—Mr. T. HAY, C.V.O., V.M.H., in the Chair, and thirteen other members present.

Award of Merit

'Lothersdale' (for Exhibition), shown by W. Whiston, Esq., Lothersdale, Far Heath, Winterley, Sandbach.

Selected for trial at Wisley

'Lothersdale,' shown by W. Whiston, Esq., Lothersdale, Far Heath, Winterley, Sandbach.
 'Scarlet Emperor,' shown by Mr. Geo. E. Toms, Appley Nurseries, Ryde, I.O.W.
 'Greyling,' shown by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs.
 'Downs Clove' and 'Downs Pink,' shown by Messrs. Allwood Bros. Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex.

Other Exhibits

'Katherine Mapes' and 'Milkmaid,' shown by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs.
 'Seedling No. 29' and 'Elegance,' shown by Mr. Geo. E. Toms, Appley Nurseries, Ryde, I.O.W.

JOINT ROCK GARDEN PLANT COMMITTEE—IRIS, Lady LAWRENCE, V.M.H., in the Chair, and six other members present.

Awards Recommended:**Preliminary Commendation**

To *Primula xanthopa*, from Mrs. G. Knox Finlay, Keillour Castle, Methven, Perthshire.

Other Exhibits

Primula tenella (P.C. 1950), which the committee wished to see again next year, from Mrs. G. Knox Finlay, Keillour Castle, Methven, Perthshire.

JULY 18, 1950

JOINT BORDER CARNATION AND PICOTEE COMMITTEE—Mr. T. HAY, V.M.H., in the Chair and twelve other members present.

Awards Recommended:

First Class Certificate

'Royal Mail,' as a show variety (votes 11 for, 0 against), shown by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs. (A.M. 1949).

Award of Merit

'Sunstar,' as a show variety (votes 11 for, 0 against), shown by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs.

Selected for trial at Wisley

'Sunstar,' 'Gavotte,' 'Dusky Maid' and 'Waternymph,' all shown by Mr. F. W. Goodfellow, Valley Nurseries, Aldridge, Staffs.

AUGUST 1, 1950

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and four other members present.

Saussurea stella.—The Committee recommended the award of a Botanical Certificate to *Saussurea stella*, exhibited by the Curator of the Chelsea Physic Garden. This remarkable member of the Compositae is a native of the high mountains of western China, eastern Tibet and the eastern Himalaya. It forms a stemless rosette of narrow outspread leaves, the broadened bases of the inner leaves being reddish and thus serving to attract attention to the closely clustered dull purple flower-heads. The whole plant thus functions as one flower with regard to pollination. It has a distinct honey-like fragrance. The plant shown had been lifted from the open ground at Chelsea. After flowering the rosette perishes but secondary rosettes may arise below it. *S. stella* is figured in *Bot. Mag.* 166 t. 85 (1949).

Tapemochilus ananassae.—An inflorescence of this rare and little-known member of the Zingiberaceae was exhibited by Mr. David Sander, St. Albans. It had come from a garden at Torquay.

Hypericum.—A specimen of a shrubby *Hypericum*, provisionally named *H. patulum* 'Hidcote,' was referred to the Royal Botanic Gardens, Kew, for further study. According to the exhibitors, Messrs. T. Hilling & Co., Chobham, Surrey, it forms a bush up to 6 feet high and wide and is one of the hardiest of shrubby *Hypericums*. It was stated to have been introduced from western China by Major Lawrence Johnston, but might possibly have arisen in Britain.

Conifers.—The Committee expressed thanks for an exhibit of Conifers sent by Commander F. Gililand of Brook Hall, Londonderry. These included *Sciadopitys verticillata*, *Abies Veitchii* and *Dacrydium Franklinii*.

Gladiolus Species.—A letter from Mr. R. L. Roberts of Enfield was read to call attention to certain errors in the naming of *Gladiolus* species by nurserymen and seedsmen. It was pointed out that some species have received a number of names and that some names have been applied incorrectly. Such a multiplication of synonyms and mis-identifications occurs in many genera and is to be expected in such a variable and botanically difficult group as the South African species of *Gladiolus*.

Fasciated Forsythia.—A specimen of *Forsythia* × *intermedia spectabilis* showing the fasciation which often occurs in this and other *Forsythias* was shown by Mr. B. J. Bounard of Raynes Park.

Maize Inflorescence.—An inflorescence of *Zea Mays* with female flowers on the lower part of the axis but male flowers above was shown by Mr. J. A. T. Douglas of Dorking.

Sprouting Potato.—Mr. Collingwood Ingram exhibited a potato which had been left in a cellar since the winter and had put out two sprawling purplish hairy shoots, one 22 inches long, the other 10 inches long, with numerous whitish lateral ramifications, on some of which small tubers had developed.

Fritillaria Capsules.—A collection of capsules of *Fritillaria* species grown by Miss C. Beck of Great Amwell showed the great variation in form within the genus; all had small membranous teeth fringing the valves, a feature occurring also in the subgenus *Cardiocrinum* but not observed in other sections of *Lilium*. The capsules of *F. pallidiflora* and *F. lanceolata* have two prominent flanges on the back of each valve, unlike those of the other species exhibited (*F. karadaghensis*, *Olivieri*, *acmopetala*, *pudica*, *pyrenaica*, *gracilis*).

Fasciated Lilium candidum.—Mr. E. A. Bowles showed a photograph of a fasciated specimen of *Lilium candidum* with the stem $3\frac{1}{2}$ inches wide.

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRETT, C.B.E., F.L.S., V.M.H., in the Chair, and twelve other members present.

Award Recommended :

To the Hon. Mrs. George Lane, Ashton Wold, Oundle, Peterborough, for a group of Soft Fruit (principally Gooseberries).

Other Exhibit

Apple 'Hambledon Deux Ans,' from 'The Principal, Dorset Farm Institute, Kingston Maurward, Dorchester.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :

Gold Medal

To Messrs. Carters Tested Seeds, Ltd., Raynes Park, for an exhibit of Gladioli.

To Messrs. Konyenbourg & Mark, Noordwyk, Holland, for an exhibit of Gladioli.

Silver-gilt Flora Medal

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Phloxes and other herbaceous plants.

To Messrs. Kelway & Son, Ltd., Langport, for an exhibit of Gladioli.

To Messrs. H. Woolman, Ltd., Birmingham, for an exhibit of Begonias.

Silver-gilt Banksian Medal

To Messrs. Mortlock Bros., Langley, for an exhibit of Fuchsias.

To Messrs. W. J. Unwin, Ltd., Histon, for an exhibit of Gladioli.

To Messrs. E. Webb & Sons (Stourbridge), Ltd., Stourbridge, for an exhibit of Phloxes and Gladioli.

Silver Flora Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.

To Messrs. T. Carlile, Ltd., Twyford, for an exhibit of Phloxes.

To Messrs. van Zanten Bros., Hillegom, Holland, for an exhibit of Gladioli.

Silver Banksian Medal

To Messrs. M. Prichard & Sons, Ltd., Christchurch, for an exhibit of herbaceous plants.

To Messrs. D. Stewart & Son, Ltd., Ferndown, for an exhibit of Gladioli.

To Messrs. Wakeley Bros. & Co., Ltd., North Mymms, for an exhibit of Gladioli.

To Messrs. John Waterer, Sons & Crisp, Ltd., Twyford, for an exhibit of Phloxes and other herbaceous plants.

Flora Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of *Dianthus Allwoodii*, etc.

To Mr. H. A. Brown, Chingford, for an exhibit of Fuchsias.

To Messrs. G. & A. Clark, Ltd., Dover, for an exhibit of herbaceous plants.

To Messrs. Daniels Bros., Ltd., Norwich, for an exhibit of Phloxes.

To Messrs. Hale & May, Ltd., Cookham, for an exhibit of herbaceous plants and Roses.

To Mr. L. S. Harbutt, Wickhambrook, for an exhibit of herbaceous plants.

To Messrs. Laidlaw Gladiolus, Ltd., Newquay, for an exhibit of Gladioli.

To Mr. E. B. Le Grice, North Walsham, for an exhibit of Roses.

To Messrs. R. & E. Ratcliffe, Chilton, for an exhibit of Roses.

To Messrs. Ryder & Son (1920), Ltd., St. Albans, for an exhibit of Phloxes.

To B. H. B. Symons-Jeune, Esq., Old Windsor, for an exhibit of seedling Phloxes.

To Messrs. Wheatcroft Bros., Ltd., Ruddington, for an exhibit of Roses.

Banksian Medal

To Mr. A. Miles, Bickley, for an exhibit of herbaceous plants.

To Messrs. Sale & Son (Wokingham), Ltd., Wokingham, for an exhibit of herbaceous plants.

To Messrs. E. C. Simmonds & Son, St. Albans, for an exhibit of herbaceous plants.

To F. T. S. Staggs, Esq., Woodford Green, for an exhibit of Coleus.

Award of Merit

To *Kniphofia*, 'Honeycomb,' as a variety for exhibition (votes 15 for, 0 against), from Messrs. M. Prichard & Sons, Ltd., Christchurch.

Selected for trial at Wisley

Dianthus seedling, from F./Lt. W. W. R. Jones, Askett, Bucks.
Kriphofia 'Gladiator,' from Messrs. M. Prichard & Sons, Ltd., Christchurch.
Rudbeckia Sullivantii 'Goldsturn' (subject to verification of name), from Messrs. T. Carlile, Ltd., Twyford.
Viola 'Chantreyland,' from Messrs. R. H. Bath, Ltd., Wisbech.

Other Exhibits

Antirrhinums, from Messrs. Fidler & Sons, Reading.
 Carnation 'Bennic Fancy,' from C. N. Nichols, Esq., Stretford.
 Chrysanthemums, from Mr. A. Miles, Bickley.
 Pelargonium 'Vivid,' from J. S. Milne, Esq., Newcastle.
 Roses and Violas, from Mr. C. A. Jardine, Feltham.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and sixteen other members present.

Awards Recommended :*Flora Medal*

To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.
 To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of greenhouse shrubs.
 To Mr. F. Street, Woking, for an exhibit of flowering shrubs.
 To Winkfield Manor Nurseries, Ascot, for an exhibit of rock garden plants and shrubs.

Banksian Medal

To Kew Topiary Nurseries, Richmond, for an exhibit of clipped box and bay trees.
 To Messrs. Robinson, Eltham, S.E. 9, for an exhibit of rock garden plants.

Award of Merit

To *Buddleia Davidi* 'Royal Red' as a hardy, flowering shrub (votes 12 for, 0 against), from Messrs. R. C. Notcutt, Ltd., Woodbridge.
 To *Rhododendron prunifolium* as a hardy, flowering shrub (votes unanimous), from The Commissioners of Crown Lands, Windsor Great Park, Berks.

Other Exhibits

Bougainvillea glabra *Cyphertii*, exhibited by Capt. R. J. B. Bolitho, Gouray Lodge, Jersey, C.I.
Buddleia Davidi 'Purple Splendour,' exhibited by Mr. E. B. Le Grice, Roseland Nurseries, North Walsham, Norfolk.
Hypericum patulum 'Hidcote,' exhibited by Messrs. T. Hilling & Co., Chobham, Surrey.
Hoheria populnea, exhibited by Col. F. C. Stern, O.B.E., M.C., F.L.S., V.M.H., Highdown, Goring-by-Sea, Sussex.

ORCHID COMMITTEE—LORD ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and eight other members present.

Awards Recommended :*Award of Merit*

To *Cypripedium* 'Vanda M. Pearman' (*bellatulum* × *Delcatur*) (votes 6 for, 1 against), from K. D. Morgenstern, Esq., 18 Lyttelton Road, London, N.2.

JOINT EARLY FLOWERING CHRYSANTHEMUM COMMITTEE—Mr. E. F. HAWES, in the Chair, and ten other members present.

Awards Recommended :*First Class Certificate*

To 'Orange Sweetheart,' for exhibition and market (votes 7 for, 0 against), and 'Salmon Sweetheart,' for exhibition and market (votes 7 for, 0 against), both shown by Colham Green Nurseries, Ltd., Chapel Lane, Hillingdon, Middlesex.

Award of Merit

To 'Deep Red Sweetheart,' for exhibition and market (votes 7 for, 0 against), and 'Golden Sweetheart,' for exhibition and market (votes 7 for, 0 against), both shown by Colham Green Nurseries, Ltd., Chapel Lane, Hillingdon, Middlesex.

Selected for trial at Wisley

'Deep Red Sweetheart' and 'Golden Sweetheart,' shown by Colham Green Nurseries, Ltd., Chapel Lane, Hillingdon, Middlesex.

'August Beauty,' shown by Messrs. Greenyer Bros., Ltd., Broadwater Green Nurseries, Worthing, Sussex.

Other Exhibits

'Peach Sweetheart' (A.M. 1949), 'Apricot Sweetheart' (A.M. 1949), 'Carol' (F.C.C. 1948), 'Cotswold Gem' (A.M. 1948) (to be seen again), 'Egerton Sweetheart' (A.M. 1945), 'Edensor' (A.M. 1947), 'Bronze Christine,' 'Bronze Sweetheart,' 'Pearl Sweetheart' and 'Sweetheart,' all shown by Colham Green Nurseries, Ltd., Chapel Lane, Hillingdon, Middlesex.

JOINT ROCK GARDEN PLANT COMMITTEE—Col. F. C. SIERN, O.B.E. M.C., F.L.S., V.M.H., in the Chair, and twelve other members present.

Exhibit

Saussurea stella (Yu. 13939) which was referred to the Scientific Committee, from The Director, Chelsea Physic Garden, Swan Walk, Chelsea, London, S.W. 3.

August 15, 1950

JOINT EARLY FLOWERING CHRYSANTHEMUM COMMITTEE—Mr G. W. LEAK, V.M.H., in the Chair, and eleven other members present.

Awards Recommended:

First Class Certificate

To 'Cotswold Gem,' as a market variety (votes 9 for, 1 against), raised by Mr W. Avery, and shown by Colham Green Nurseries Ltd., Hillingdon, Middlesex.

Award of Merit

To 'Rearlight,' as a variety for exhibition and market (votes 7 for, 1 against), and 'Foremost,' as a variety for exhibition and market (votes 9 for, 2 against), both shown by Messrs. J. & T. Johnson, The Nurseries, Tibshelf, Derbyshire.

To 'Yellow Sands,' as a variety for exhibition and market (votes 10 for, 0 against), shown by Mr. John R. Bell, Southdown Nurseries, Horam, E. Sussex.

To "Sport from 'Radar'" (subject to naming) as a variety for exhibition and market (votes 11 for, 0 against), shown by Mr. H. Johnson, 4 Colonial Road, Slough Bucks.

To "Seedling 'I'" (subject to naming) for exhibition and market (votes 11 for, 0 against) shown by Colham Green Nurseries Ltd., Hillingdon, Middlesex.

Selected for trial at Wisley

'Rearlight' and 'Foremost,' shown by Messrs. J. & T. Johnson, The Nurseries, Tibshelf, Derbyshire.

'No. 1 Pom,' shown by Messrs. H. Shoesmith Ltd., Mayford Nurseries, Westfield, Woking.

'Yellow Sands' shown by Mr. John R. Bell, Southdown Nurseries, Horam, Sussex.

"Sport from 'Radar'" shown by Mr. H. Johnson, 4 Colonial Road, Slough, Bucks.

"Seedling 'I'" shown by Colham Green Nurseries Ltd., Hillingdon, Middlesex.

Other Exhibits

'Serenade,' (A.M. 1948), shown by Messrs. H. Shoesmith Ltd., Mayford Nurseries, Westfield, Woking.

'Salmon Vernon,' shown by Mr. G. R. Bacon, Heathfield Nurseries, Ecclesfield, Bradford.

"Seedling 'E'" and "Seedling 'B'" shown by Colham Green Nurseries Ltd., Hillingdon, Middlesex.

JOINT DAHLIA COMMITTEE—Mr. G. MONRO, C.B.E., V.M.H., in the Chair, and eleven other members present.

Awards Recommended:

Award of Merit

To Dahlia 'Croydon Masterpiece,' as a variety for exhibition (votes 10 for, 0 against), from J. Riding, Esq., Hockley, Essex.

Selected for trial at Wisley

Dahlias 'Mary Wills,' 'Yellow Plume' from A. T. Barnes, Esq., Bedford.

Dahlias 'Loesje,' 'Jescot Lingold,' 'Jescot 620' (to be named).

Dahlia 'Croydon Masterpiece' from J. Riding, Esq., Hockley, Essex.

Dahlia 'Almech,' 'Jaune Belge' from Messrs. J. F. Spencer & Son, Ltd., Hockley, Essex.

Dahlias 'Appledore,' 'Barbara Bacon,' 'Beckley,' 'Canon Griffiths,' 'Steyning' and another variety subject to naming.

Other Exhibits

Dahlias were also submitted by G. B. Williams Esq., Crowthorne.

AUGUST 29, 1950

SCIENTIFIC COMMITTEE—Mr. E. A. Bowles, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and seven other members present.

Gladiolus Thrips.—Mr. Fox Wilson stated that the presence of the *Gladiolus Thrips* (*Taeniothrips simplex* Morison), had been confirmed in England during August 1950 on both commercial and garden stocks of *Gladiolus* in many widely separated areas. This American species of Thrips overwinters on the corms and, from data received, would appear to have been present in this country in 1949 and perhaps earlier. High populations were built up during August and infested blooms were rendered useless.

Stolons of Yellow Loosestrife.—Mr. N. K. Gould illustrated the colonizing ability of the Yellow Loosestrife (*Lysimachia vulgaris*) by exhibiting a floating stolon 12 feet long taken from a ditch at Wisley. It had grown to this length in about four months.

Musk Rose.—Mr. E. A. Bowles exhibited a flowering spray of a climbing Rose with delightfully scented, creamy white, semi-double flowers, illustrated in Redouté and Thory, *Les Roses* 1, 99 (1817) as *Rosa moschata flore semi-pleno*, which he had acquired from Canon Ellacombe at Bilton, many years ago, and which was thought to be the musk Rose of Shakespeare. It is a fine garden plant which has almost disappeared from cultivation but deserves to be propagated and widely grown.

Green-flowered Dahlia.—A green-flowered Dahlia from Wisley was examined with much interest. It did not appear to be absolutely identical with the form previously known as *Dahlia viridiflora* but was morphologically comparable, the coloured florets being mostly suppressed and the scales of the receptacle much enlarged and leafy. The heads were about 3.5 to 4.5 cm. in diameter; some were totally green; others had a few crimson florets to 1.5 cm. long, 1.8 cm. broad.

Chrysalis of Eggar Moth.—Mr. W. G. MacKenzie showed a large cocoon found on a clump of white Heather (*Calluna vulgaris* forma). It was identified as that of the Northern Eggar Moth (*Lasocampa quercus* var. *callunae* Palmer).

Provenance of *Chrysanthemum praeteritum*.—In 1930 A. R. Horwood described a new species, *Chrysanthemum praeteritum*, from a plant of unknown origin cultivated at Kew since 1912.

The affinities of this species, which is of low sub-shrubby growth and has attractive silvery tomentose foliage and white flowers, indicated that it had probably been introduced from Asia Minor. This has now been confirmed by the collecting of Mr. Peter Davis. Mr. W. T. Stearn exhibited a dried specimen from the type-plant of *Ch. praeteritum* at Kew and another specimen from a plant recently introduced by Davis from southern Asia Minor. Though not completely identical, the two belong to the same species. According to Briquet's classification, this should be placed in *Tanacetum* though very distinct from the common Tansy (*Tanacetum vulgare*).

Hybrid *Senecio*.—Mr. W. T. Stearn exhibited living specimens of *Senecio squahdus* (Oxford Ragwort), *S. viscosus* and the hybrid between them, *S. × londonensis* Lousley in *Rept. Bot. Exch. Club Brit.* 12, 311 (1946), gathered that day in Vincent Square. Vigorous plants of the hybrid were as much as 2 feet high and loosely branched, with ray florets intermediate in size between those of the parent species.

Large-leaved Oak.—The Committee examined some extremely large leaves of the common Oak (*Quercus Robur*) communicated by Mr. J. B. Sherlock, Renvyle, Billingshurst, Sussex. They came from a single branch, one of the lowest on the tree, which had been lopped last year. As they were outside the usual range of variation of *Q. Robur*, there seemed a possibility that a doubling of chromosomes had taken place and the Committee recommended that the branch should be kept under observation.

Pelargonium Hybrids.—Mr. A. Langley Smith placed before the Committee some young plants of *Pelargonium* hybrids derived from crosses made in 1910 between *Pelargonium denticulatum* and *P. filicifolium* and others derived from later crosses of *P. denticulatum*, *P. quercifolium* and *P. radula*. Variegated seedlings had appeared and this variegation had been inherited by some of their progeny.

Extracts from
THE PROCEEDINGS OF
THE ROYAL HORTICULTURAL SOCIETY

GENERAL MEETINGS

SEPTEMBER 6, 1949

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SUDRIFT, C.B.E., F.R.S. V.M.H., in the Chair and ten other members present.

Exhibits

Awards Recommended:

Silver Hogg Medal

To Messrs. Bees, Ltd., Liverpool and Chester, for a group of Apples and Pears.

Bronze Landley Medal

To the Viticultural Research Station, Oxted, Surrey, for a group of Grapes.

Other Exhibits

Apple 'Red King,' from R. A. Whiting, Esq., 172 Shirehall Road, Hawley, Nr. Dartford, Kent.

Apple Seedling No. 15 ('Langley Pippin' × 'Worcester Pearmain'),

Apple Seedling No. 11 ('Langley Pippin' × 'James Grieve'),

Apple Seedling No. 13 ('Langley Pippin' × 'James Grieve') and

Apple Seedling No. 2 ('James Grieve' × 'Worcester Pearmain'), from Mr. N. W. Barritt, Ince Orchard, Nr. Chester.

Apple Seedling, from C. L. Tritton, Esq., Shepherd's Corner, Ramelet, Lewes, Sussex.
Plum 'Thames Cross,' from University of Bristol Research Station, Long Ashton, Bristol.

Peach 'Climaden,' from C. Smith, Esq., 70 Oaks Avenue, Worcester Park, Surrey.

Peach 'Bushwood Beauty,' from Messrs. L. R. Russell, Ltd., Richmond Nurseries, Windlesham, Surrey.

Black Currant 'Letcham Beauty,' from P. H. Salter, Esq., 151 Staines Road, Letcham, Middlesex.

Apple Seedling, from Mr. Wager, Ivy Cottage, Godalming, Surrey.

Peach Seedling, from H. M. Gadge, Esq., 9 Longley Road, London, S.W. 17.

FLORAL COMMITTEE A—Mr. G. W. LEAL, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended:

Gold Medal

To Mr. Stuart Oger, Swanley, Kent, for an exhibit of Dahlias.

Silver-gilt Flora Medal

To Messrs. Bees, Ltd., Chester, for an exhibit of Gladioli, Kniphofias, and herbaceous flowers.

To Messrs. Brown & Such, Ltd., Royal Berkshire Nurseries, Maidenhead, for an exhibit of Dahlias.

Silver-gilt Banksian Medal

To Mr. J. R. Bell, Cross-in-Hand, Heathfield, Sussex, for an exhibit of Chrysanthemums.

To Rose Cottage Nurseries, Enderby, Leics., for an exhibit of Dahlias.

To Messrs. J. F. Spencer & Son, Ltd., Hockley, Essex, for an exhibit of Dahlias.

To Messrs. A. G. Vinten, Ltd., Old Land Nurseries, Balcombe, Sussex, for an exhibit of herbaceous flowers.

Silver Flora Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.

To Messrs. Mortlock Bros., 437 London Road, Langley, Bucks., for an exhibit of Fuchsias.

To Messrs. Westwell & Sons, The Nurseries, Leigh, Lancs., for an exhibit of Dahlias.

To Messrs. Wheatecroft Bros., Ltd., Nottingham, for an exhibit of Roses.

To Messrs. William Wood & Son, Ltd., Taplow, Bucks., for an exhibit of herbaceous flowers.

Silver Banksian Medal

To Mr. H. A. Brown, Chingford, for an exhibit of Fuchsias.

To Messrs. T. Carlile, Ltd., Carlile's Corner, Twyford, Berks., for an exhibit of herbaceous flowers.

To Messrs. Wm. Lowe & Son, Beeston, Nottingham, for an exhibit of Roses.

To Mr. E. R. Lynas, Redcar, Yorks., for an exhibit of Gladioli.

To Mr. A. Miles, Southborough Nurseries, Bickley, Kent, for an exhibit of herbaceous flowers.

To Messrs. Wakeley Bros. & Co. Ltd., North Mymms, Herts, for an exhibit of Gladioli.

Flora Medal

To Messrs. J. Cheal & Sons, Ltd., Lowfield Nurseries, Crawley, Sussex, for an exhibit of Dahlias.

To Messrs. Hale & May, Ltd., Cookham, Berks., for an exhibit of herbaceous flowers.

To Messrs. Hewitt & Co., Stratford-on-Avon, for an exhibit of Dahlias, Thalictrums, and Delphiniums.

To Messrs. Kelway & Son, Ltd., Langport, Somerset, for an exhibit of Gladioli.

To Messrs. M. Prichard & Sons, Ltd., Christchurch, Hants., for an exhibit of Gladioli, Kniphofias and herbaceous flowers.

Banksian Medal

To Messrs. B. R. Cant & Sons, Ltd., The Old Rose Gardens, Colchester, for an exhibit of Roses.

To Messrs. G. A. Clark, Ltd., Dover, for an exhibit of herbaceous flowers.

To Messrs. Daniels Bros., Ltd., Norwich, for an exhibit of Phlox.

To Home Meadow Nurseries, Martlesham, Suffolk, for an exhibit of Dahlias.

To Mr. E. B. Le Grice, Roseland Nurseries, North Walsham, Norfolk, for an exhibit of Roses.

To Messrs. E. C. Simmonds & Son, Verulam House, St. Albans, for an exhibit of herbaceous flowers.

To Mr. S. Sims, Draycott, Derbyshire, for an exhibit of herbaceous flowers.

Award of Merit

To Rose 'Grandmere Jenny' (votes 13 for, 0 against), exhibited by Messrs. Wheatcroft, Ltd., Nottingham.

Selected for trial at Wisley

Gaillardia Eastwood, exhibited by Messrs. Eastwood Nurseries, Bagenalstown, Co. Carlow, Ire.

Gaillardia 'Draycott Beauty,' exhibited by Mr. S. Sims, Draycott, Derbyshire.

Scabiosa caucasica var. 'Souter's Market Favourite,' exhibited by Mr. G. B. M. Souter, Rosemary, Wellington Road, Chichester, Sussex.

Scabiosa caucasica var. 'Souter's Dinkie,' exhibited by Mr. G. B. M. Souter, Rosemary, Wellington Road, Chichester, Sussex.

Other Exhibits

Statice latifolia var. 'Chilwell Beauty,' from Mr. S. Sims, Draycott, Derbyshire.

Gerberas, mixed single hybrids, 'Pillhead Supreme,' 'Pillhead Sarah,' 'Pillhead Inniskilling,' 'Pillhead Sunglow,' from Lt. Col. Ansell, Pillhead Flower Farm, Bideford.

Fuchsias shown by H. W. Scarlos, Esq., 119 Broadway Avenue, Twickenham, Middx.

Fuchsias shown by R. H. McDowell, Esq., 1 Kinfahns Road, London, S.W. 2.

The Chairman stated that the Chrysanthemum exhibited by Messrs. Colham Green Nurseries, under the name of 'Dark Pink Orchid Queen' did not conform to the rules of nomenclature. The Canadian raiser has agreed to the name being 'Dark Orchid Queen.' The name has been changed to this in the records of the Chrysanthemum Society of America.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:**Gold Medal**

To Messrs. G. & R. Perry, Enfield, for an exhibit of aquatic and waterside plants.

Silver Banksian Medal

To Messrs. J. Cheal & Sons, Ltd., Crawley, for an exhibit of flowering shrubs.

To Robinson's Gardens Ltd., Eltham, for an exhibit of rock-garden plants.

Flora Medal

- To Mrs Blackett-Swiny, Dumfries, for an exhibit of shrubs and herbaceous plants.
 To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, for an exhibit of alpine plants in pans
 To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of Clematis and other flowering shrubs.
 To Winkfield Manor Nurseries, Ltd., Ascot, for an exhibit of rock-garden plants.
 To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulent plants.
 To Mr. F. Street, Woking, for an exhibit of Heathers.
 To Messrs. Ryder & Sons, Ltd., St. Albans, for an exhibit of Heathers.
 To Mr. W. Kibble, Lightwater, for an exhibit of rock-garden plants.

Banksian Medal

- To the Kew Topiary Nurseries, Richmond, for an exhibit of clipped box and bay trees
 To MacPenny Nurseries, Christchurch, for an exhibit of rock-garden and herbaceous plants.
 To Lt.-Col. L. H. Brammall, Salisbury, for an exhibit of alpine plants in pans.

First Class Certificate

- To *Amaryllis Belladonna* 'Hathor,' as a semi-hardy, flowering, bulbous plant (votes 9 for, 0 against), from 'The Director, Royal Botanic Gardens, Kew.'

Award of Merit

- To *Abutilon megapotamicum*, as a semi-hardy, flowering shrub (votes unanimous), from Sir Henry Price, Wakehurst Place, Ardingly, Sussex.
 To *Campsis grandiflora*, as a hardy flowering climber (votes unanimous), from The Director, R.H.S. Gardens, Wisley.
 To *Erodia huphous*, as a hardy fruiting shrub (votes unanimous), from Colonel F. C. Stern, O.B.E., M.C., V.M.H., Highdown, Goring-by-Sea.
 To *Fasicularia bicolor*, as a hardy flowering plant (votes 7 for, 1 against) (subject to verification of name), from Sir Henry Price, Wakehurst Place, Ardingly.
 To *Vernonia arkansana*, as a hardy flowering herbaceous plant (votes 9 for, 0 against), from Messrs. M. Prichard & Sons, Ltd., Christchurch.

Preliminary Commendation

- To *Campsis Taghavana*, as a hardy flowering climber (votes 8 for, 1 against), from The Director, R.H.S. Gardens, Wisley.

Other Exhibits

- Amaryllis Belladonna* var. *clata*, exhibited by Capt. H. S. Stokes, Longdon, Rugeley, Staffs.
Buddleia Davidi 'Splendour,' *Tamarix hispida aestivalis rubra*, exhibited by Mr. E. B. le Grice, Rosland Nurseries, North Walsham.
Colquhounia vestita, *Daphne* sp., exhibited by Sir Henry Price, Wakehurst Place, Ardingly.
Hydrangea macrophylla 'Amethyst,' *H. m.* 'Hamburg,' exhibited by M. Haworth-Booth, Esq., Farall Nurseries, Haslemere.
Tripterygium Forresteri, exhibited by Col. F. C. Stern, O.B.E., M.C., V.M.H., Highdown, Goring-by-Sea.

JOINT DAHLIA COMMITTEE—Mr. G. MONRO, C.B.E., V.M.H., in the Chair, and sixteen other members present.

Selected for trial at Wisley

- 'Bedford Rose' and another variety subject to re-naming from A. T. Barnes, Esq., Bedford.
 'Sheila Brunton,' from Mr. J. F. Barwise, Burnley.
 'Blueboat,' 'Jescot Orange,' from Messrs. E. Cooper & Son, St Albans
 'Rosemary Golby,' from Messrs. J. Golby & Son, Northampton.
 'Bentley,' 'Rowledge,' from Mr. Owen Parratt, Farnham.
 'Douglas Meredith,' 'Esme Swall,' 'Thistle,' 'William Evans,' and one other variety subject to re-naming from Messrs. J. Stredwick & Son, St. Leonards-on-Sea.

To be seen again

- 'Bowland,' from Mr. J. F. Barwise, Burnley.
 Seedlings No. 3, No. 4, No. 5, from Mrs. M. Maughan, Chilworth, Southampton.
 'Winnie Way,' from Messrs. J. Stredwick & Son, St. Leonards-on-Sea.
 Dahlias were also submitted by Messrs. Brown & Such Ltd., Maidenhead; Mr. D. Foxwell, Balcombe; Mr. J. C. Ottaway, Epsom; Messrs. J. F. Spencer & Son, Hockley; Mr. H. Tampkins, Little Thurrock; Messrs. van den Bogaert, Linkebeek, Belgium.

JOINT EARLY FLOWERING CHRYSANTHEMUM COMMITTEE—Mr. E. F. HAWES in the Chair, and twelve other members present.

Awards Recommended:

Award of Merit

To 'Primo,' as an exhibition variety (votes 6 for, 0 against), shown by Colham Green Nurseries Ltd., Hillingdon, Middlesex.

To 'Chatsworth,' as an exhibition variety (votes 7 for, 0 against), shown by Messrs. J. & T. Johnson, Tibshelf, Derbyshire.

To 'Royal Flame,' as an exhibition variety (votes 10 for, 0 against), shown by Messrs. John R. Bell, Cross-in-Hand, Sussex.

Selected for trial at Wisley

'Primo,' 'Prince' and 'Steadfast,' from Colham Green Nurseries, Hillingdon, Middlesex.

'Golden McLeod,' from Mr. D. Baldwin, Longcroft Nurseries, Laycock, Keighley.

'Prim' and 'Chatsworth,' from Messrs. J. & T. Johnson, Tibshelf, Derbyshire.

'Bonnie' and 'Royal Flame,' from Messrs. John R. Bell, Cross-in-Hand, Sussex.

Other Exhibits

'Yellow Symphony,' from Mr. Norman Greenwood, Woodbank Nurseries, Harden, Bingley, Yorks.

'Chas. E. Morris' (to be seen again) and 'Royal Sovereign,' from Messrs. Wilson & Clark, The Broadway, Cricklewood, N.W.2

SEPTEMBER 7, 1949

JOINT EARLY FLOWERING CHRYSANTHEMUM COMMITTEE—Mr. G. W. LEAK, V.M.H., in the Chair, and nine other members present.

Awards Recommended:

Award of Merit

To 'Arthur Ward,' as an exhibition variety (votes 9 for, 0 against) and 'Delicacy,' as an exhibition variety (votes 7 for, 2 against), both shown by Messrs. H. Shoosmith, Ltd., Mayford Nurseries, Woking, Surrey

SEPTEMBER 13, 1949

JOINT DAHLIA COMMITTEE—Mr. F. CHRYM in the Chair, and fourteen other members present.

Selected for trial at Wisley

'Amiable,' 'Ormerod,' from Mr. J. F. Barwise, Burnley.

'Aristos,' 'Jescol Hilda,' from Messrs. E. Cooper & Son, St. Albans

'Frankendael,' 'Fynhila,' 'Goldene Rechtschaffenheit,' 'Mothersmind,' 'Paryane,' and four other varieties subject to re-naming from the Dutch Dahlia Society, Aalsmeer, Holland.

'W. Griffiths,' from Mr. Arthur Griffiths, Herne Hill, S.E. 24

'Cynurus,' 'Don's Surprise,' 'F. Oliver,' from Mr. H. Kirby, Usk, Mon.

'Little Eric,' from Mr. Owen Parratt, Boundstone Nursery, nr. Farnham, Surrey

'Dorothy Jordan Lloyd,' from Messrs. R. Sandford & Co., Bury St. Edmunds.

'Little Francis,' 'Melba Hankin,' from Messrs. J. F. Spencer & Son, Hockley

'Kendal Pride,' 'Scarletta,' from Messrs. Clarence Webb & Co., Kendal.

'Brabazon,' 'Frank Daws,' 'Gothic,' 'Heathrow,' 'Vargas Gardner,' and one other variety subject to re-naming from Messrs. J. Stradwick & Son, St. Leonards-on-Sea.

Dahlias were also submitted by Messrs. Brown & Such Ltd., Maidenhead, Mr. C. Dawson, Ecclesfield, Mr. B. Gerussi, Hockley, Mr. H. Lowe, Tibshelf, Mr. A. H. Sheppard, Winchmore Hill, Mr. D. Trow, Bath, Mr. W. J. Vernon, Caversham

JOINT EARLY FLOWERING CHRYSANTHEMUM COMMITTEE—Mr. G. W. LEAK, V.M.H., in the Chair and twelve other members present

Awards Recommended:

Award of Merit

To 'Yellow Barbara,' sport from 'Barbara,' as an exhibition variety (votes 11 for, 0 against), shown by Mr. W. B. Jackson, Brown Heath Nursery, Waverton, Chester.

To 'Pirate' (votes 10 for, 0 against), and 'Corncomb' (votes 8 for, 0 against), both as exhibition varieties, shown by Messrs. Greenyer Bros., Broadwater Green Nurseries, Worthing, Sussex.

To 'Prima Donna' (votes 11 for, 0 against), and 'Gladys Case' (votes 8 for, 4 against), both as exhibition varieties, shown by Messrs. H. Shoosmith, Ltd., Mayford Nurseries Woking, Surrey

Extracts from THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY

GENERAL MEETINGS

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. SECRET, C.B.E., F.L.S., V.M.H., in the Chair, and eleven other members present.

Awards Recommended:

Silver-gilt Knightian Medal

To the Hon. Mrs. G. Lane, Ashton Wold, Oundle, Northants., for a group of Vegetables.

Hogg Medal

To Messrs. Winkfield Manor Nurseries, Ascot, Berks., for a group of Apples and Pears.

Other Exhibits

Apple Seedling 'Cheal's No. 40' from Messrs. J. Cheal & Sons Ltd., Lowfield Nurseries, Crawley, Sussex.

Peach Seedling from H. E. North, Esq., 20 Durrants Drive, Croxley Green, Rickmansworth, Herts.

Apple Seedling from H. A. M. Vokes, Esq., 107 North East Road, Sholing, Southampton.

Apples 'Manning's Special' and 'Kinga' from H. L. Hawes, Esq., Hillside, Queens Park, Billericay, Essex.

Plum Seedling from Miss O. M. Chambers, Lested Lodge, Chart Sutton, Maidstone, Kent.

Group of Melons from The Director, Royal Horticultural Society's Gardens, Wisley.

Group of Cabbages from The Director, Royal Horticultural Society's Gardens, Wisley.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and fourteen other members present.

Awards Recommended:

Gold Medal

To Messrs. F. M. Wyatt and I. J. Ferguson Lees, of the Tilgate Horticultural Station, for an exhibit of cut branches of conifers, bearing cones.

Silver Banksian Medal

To Messrs. Haskins Bros. Ltd., Bournemouth, for an exhibit of Clematis and other flowering shrubs.

To Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead, for an exhibit of dwarf shrubs and rock garden plants.

To Mr. F. Street, Woking, for an exhibit of hardy Heaths and conifers.

Flora Medal

To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of flowering shrubs.

To Mr. K. W. Harle, Lower Basildon, for an exhibit of succulents.

To Messrs. Robinson's Nurseries, Eltham, for an exhibit of rock garden plants.

To Messrs. L. R. Russell, Ltd., Windlesham, for an exhibit of Clematis and other flowering and foliage shrubs.

Banksian Medal

To Messrs. Kew Topiary Nurseries, Ltd., Richmond, for an exhibit of clipped trees.

To Messrs. Underwood Bros., Woking, for an exhibit of hardy Heaths.

Award of Merit

To *Clematis* 'Edward Prichard' (*heracleaefolia* × *recta*) as a hardy, herbaceous, flowering plant (votes unanimous), from Messrs. M. Prichard & Sons, Ltd., Christchurch.

To *Hydrangea villosa* as a hardy, flowering shrub (votes 10 for, 0 against), from W. Bentley, Esq., Quarry Wood, Burghclere, Newbury.

To *Rosa Moyesii* 'Geranium' as a hardy, ornamental-fruited shrub (votes unanimous), from A. T. Johnson, Esq., Bulkeley Mill, Tyn-y-Groes, Conway.

Preliminary Commendation

To *Codonopsis* sp. nova, L. & S. 19620, as a hardy flowering plant (votes unanimous), from W. Bentley, Esq., Newbury.

Other Exhibits

Abies magnifica, exhibited by Colonel R. S. Clarke, M.P., Borde Hill, Haywards Heath, Sussex.

Rosa Stoeckinowii, exhibited by A. T. Johnson, Esq., Bulkeley Mill, Tyn-y-Groes, Conway, N. Wales.

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